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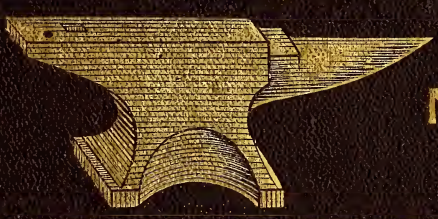

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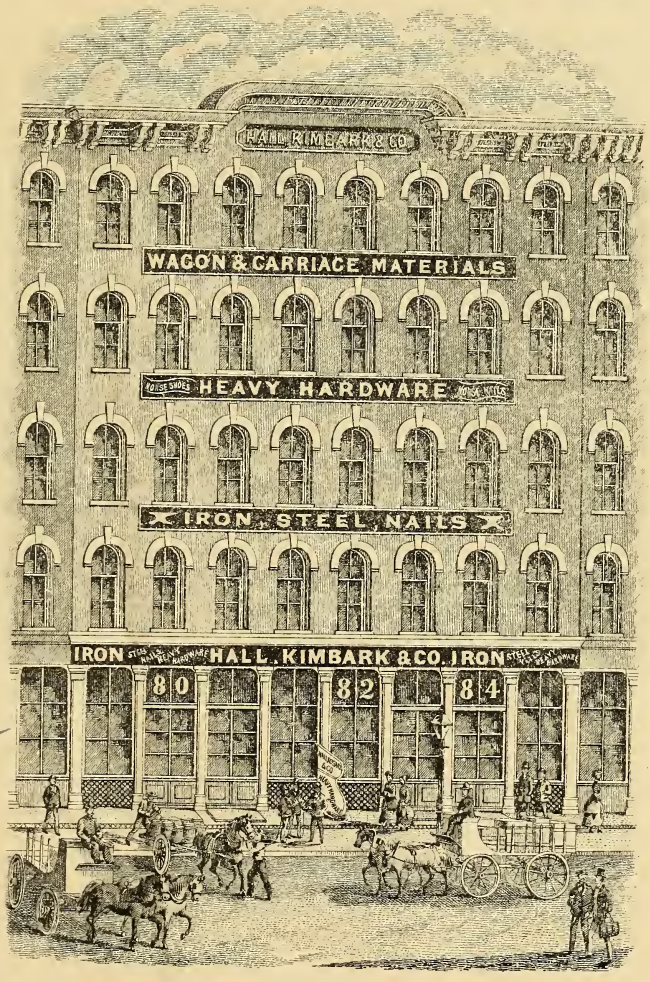

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CHURCH, GOODMAN AND DONNELLEY, PRINTERS AND PUBLISHERS,
108 and 110 Dearborn Street, Chicago.

TO OUR TRADE.

We have spared neither time nor money in the compilation and illustration of this Catalogue, with the view of placing in the hands of our numerous patrons a work sufficiently complete to enable them to select from our stock any articles they may desire, without the expense of traveling, or the delay usually attending correspondence.

We shall at all times keep a *full* stock of the goods herein described, comprising Iron, Steel, Nails, Heavy Hardware, Railway and Machinists' Supplies, Wagon and Carriage Hardware and Wood Material, which will enable us to fill all orders with promptness. Asking a continuance of the patronage heretofore extended to us, we remain,

Yours, respectfully,

HALL, KIMBARK & CO.

INDEX AND PRICE LIST.

	PAGE.		RATE.
ANVILS —			
Eagle, Cast Iron,	74	Nos. 0 to 9.	Dis. from list.
do. do.	74	100 lbs. to 210 lbs.	per lb.
do. do.	74	210 lbs. to 320 lbs.	
do. do.	74	Over 320 lbs.	
Star, do.	74	Nos. 0 to 9.	Dis. from list.
do. do.	74	100 lbs. to 210 lbs.	per lb.
do. do.	74	210 lbs. to 320 lbs.	
do. do.	74	Over 320 lbs.	
P. Wright's Wrought Iron,	74		per lb.
Armitage & Co.'s do.	74		do.
AXLES —			
Anchor,	160		Dis. from list.
Dalzell's,	161		do. do.
Concord,	162		do. do.
Common, Half Pat., Long Stock,	163		per lb.
do. do. Short do.	163		Dis. from list.
do. Long Stock,	164		per lb.
do. Weights of	165		
Hollow,	173	Made to order.	
Hickory,	277		Dis. from list.
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Superior,	194		Dis. from list.
Norway,	194		do. do.
Smith's,	195		do. do.
ANTI-RATTLERS —			
Fifth Wheel,	198		Dis. from list.
Coupling, Plain Pattern,	198		do. do.
Coupling, Central Park do.	198		do. do.
BABBITT METAL,	39		per lb.
BORAX —			
Refined,	39		per lb.
BELLOWS —			
Ordinary Pattern,	110		Dis. from list.
Long do.	110		do. do.
BEETLE RINGS,	67		per lb.
BLOWERS —			
Sturtevant's,	116-117		Dis. from list.
BOLSTER PLATES —			
Common,	181		Dis. from list.
Miles' Patent,	181		do. do.
Wrought Iron,	181		do. do.

	PAGE.		RATE.
BOLTS—			
Carriage, Common,	51		Dis. from list.
do. R. B. & W.,	52		do. do.
Tire, Common,	53		do. do.
do. R. B. & W.,	53		do. do.
Plow, R. B. & W.,	54		do. do.
do. do.	54	In bulk—$\frac{5}{8}$.	per ℔.
Sleigh,	53		Dis. from list.
Elevator,	53		do. do.
Coal Car,	54		do. do.
Pit,	54		do. do.
Machine,	55		do. do.
Bridge,	56	1 to 2$\frac{1}{4}$ dia. over 8 ft.	per ℔.
Bolt Ends,	56	do. do.	do.
Fish Plate,	57	Forged thread, $\frac{3}{4}$ and $\frac{13}{16}$,	per ℔.
Skein,	57	$\frac{3}{4}$ and $\frac{5}{8}$.	do.
Lag Screw,	57	do.	do.
Turnbuckle,	57	1$\frac{1}{8}$.	do.
do.	57	$\frac{5}{8}$ each, and $\frac{1}{2}$	each.
Wagon Box, Strap,	183		Dis. from list.
Shaft, Diamond Head,	197		do. do.
do. Tee Head,	197		do. do.
Whiffletree,	196		do. do.
Set Screw,	56		do. do.
Tap,	56		do. do.
Coach Screws, Gimlet Pointed,	57	$\frac{5}{8}$ in.	per lb.
BENT BOWS,	284		Dis. from list.
BENT CUTTER STUFF—			
Swell Body,	285		Dis. from list.
Square do.	285		do. do.
BENT CUTTER RUNNERS,	285		Dis. from list.
BENT BOB RUNNERS,	286		Dis. from list.
BENT KNEES AND BEAMS,	286		Dis. from list.
BENT HAWNS,	287		Dis. from list.
BENCH SCREWS,	138		Dis. from list.
BIT BRACES,	134		Dis. from list.
BODIES—			
Carriage and Wagon,	253 to 259		Dis. from list.
BURRS—			
Riveting,	47	$\frac{5}{16}$ wire.	per lb.
BUTTRESSES,	107		per doz.
CHAINS—			
Straight Coil, Common,	69	1$\frac{1}{4}$ in. dia.	per ℔.
do. Best Short Link,	69	do.	do.
do. Best Crane,	69	do.	do.
Twist Coil, Common,	69	1$\frac{1}{4}$ in dia.	do.
do. Best Short Link,	69	do.	do.
do. Best Crane,	69	do.	do.

CHAINS —	PAGE.			RATE.
Binding,	70			per ℔.
Breast,	70			do.
Break,	70			do.
Beetle Rings,	70			do.
Back,	70			do.
Bed,	70			do.
Breeching,	70			do.
Car Brake,	70			do.
Colter,	70			do.
Crane,	70			do.
Cow Ties,	70, 71	$\frac{3}{16}$	and $\frac{1}{4}$ in. dia.	do.
Drill,	70			do.
Ditching,	70			do.
Double Tree Rings,	70			do.
Fence,	70			do.
Hoisting,	70			do.
Hitching Rings,	70			do.
Jockey,	70			do.
Jack,	70			do.
Log,	70			do.
Lock,	70, 71	$\frac{1}{4}$	and $\frac{5}{16}$.	do.
Neck Yoke Rings,	70			do.
Oval Link,	70			do.
Pole,	70, 71	$\frac{1}{4}$	and $\frac{5}{16}$.	do.
Pulley Block,	70			do.
Rest,	70			do.
Single Tree Rings,	70			do.
Studded,	70			do.
Scraper,	70			do.
Shaft,	70			do.
Stump,	70			do.
Stage,	70			do.
Stay,	70 and 71	$\frac{1}{4}$	and $\frac{5}{16}$.	do.
Ship,	70			do.
Spreading,	70			do.
Twisted,	70			do.
Trap,	70			do.
Trace,	70			do.
Tongue,	70			do.
Differential Pulley Blocks,	72-73			Dis. from list.
CLIPS —				
Axle, Superior,	194			Dis. from list.
do. Norway,	194			do. do.
do. Smith's,	195			do. do.
Saddle,	196			do. do.
Spring Bar,	195			do. do.
King Bolt, Plain,	188			do. do.
do. Excelsior,	188			do. do.
do. and Perch Bed Plate,	189			do. do.
CARRIAGE BODIES,	253 to 259			Dis. from list.

	PAGE.		RATE.
CULTIVATOR SHOVELS —			
German Steel,	34		per ℔.
Bessemer do.	34		do.
Cast do.	34		do.
COLTER PLATES —			
German Steel,	35		per ℔.
Bessemer do.	35		do.
Cast do.	35		do.
CHAIRS —			
Railroad, Cast,	24		per ℔.
do. Wrought,	24		do.
CUSHIONS —			
Horse Shoe, all sizes,	44		per doz. prs.
CROSS BARS,	279		Dis. from list.
COACH SCREWS —			
Gimlet Pointed,	57	$\frac{5}{8}$ in. dia.	per ℔.
CARRIAGE BOLTS —			
Common,	51		Dis. from list.
R. B. & W.,	52		do. do.
COAL CAR BOLTS —	54		Dis. from list.
CLAMPS —			
Plain,	136		Dis. from list.
Improved,	136		do. do.
Adjustable,	136		do. do.
CROW BARS —			
Single Heel, Iron, Steel Pointed,	64		per ℔.
do. Solid Steel,	64		do.
Double Heel, Iron, Steel Pointed,	64		do.
do. Sold Steel,	64		do.
Lining, Iron, Steel Pointed,	64		do.
do. Solid Steel,	64		do.
Pinch, Plain, Iron, Steel Pointed,	64		do.
do. do. Solid Steel,	64		do.
do. with Heel, Iron, Steel P.,	64		do.
do. do. Solid Steel,	64		do.
Tamping, Iron, Steel Pointed,	64		do.
do. Solid Steel,	64		do.
CLAW BARS —			
Single Heel, Iron, Steel Pointed,	65		per ℔.
do. Solid Steel,	65		do.
Double Heel, Iron, Steel Pointed,	65		do.
do. Solid Steel,	65		do.
CUTTER STUFF —			
Swell Body,	285		Dis. from list.
Square do.	285		do. do.
CUTTER RUNNERS.	285		Dis. from list.
DIES —			
For Stocks,	325		Dis. from list.

	PAGE.	RATE.
DRILLS —		
Blacksmith's Tire,	139	Dis. from list.
Coe's Patent,	140	do. do.
Rastetter's Patent.	139	do. do.
Bishop's Ratchet,	141	do. do.
Packer's do.	141	do. do.
Weston's do.	142	do. do.
Moore's Triple Action,	143	do. do.
Packer's Boiler,	141	do. do.
Moore's Triple Action Wrench,	143	do. do.
Feather (for stone), Iron, Steel P.,	65	per ℔.
do. do. Solid Steel,	65	do.
Churn, do. Iron, Steel P.,	65	do.
do. do. Solid Steel,	65	do.
Socket, do. Iron, Steel P.,	65	do.
do. do. Solid Steel,	65	do.
Jumper, do. Iron, Steel P.,	65	do.
do. do. Solid Steel.	65	do.
Spoons, Solid Steel,	65	each.
Needles, do.	65	do.
DASH FRAMES,	247	Dis. from list.
DASH RODS,	247	Dis. from list.
DOUBLE TREE PLATES,	182	per ℔.
END BOARD RODS —		
Wide Track,	183	per 100 rods.
Narrow do.	183	do.
Rod Nuts and Washers,	323	per lb.
EVENERS —		
Wagon,	280	Dis. from list.
Buggy,	280	do. do.
ELEVATOR BOLTS,	53	Dis. from list.
FORGINGS —		
Wrought Iron —	27	
Car Axles,	27	per ℔.
Driving Axles,	27	do.
Truck do.	27	do.
Connecting Rods,	27	do.
Cranks,	27	do.
Crank Pins,	27	do.
Piston Rods,	27	do.
Steamboat Shafting,	27	do.
Mill do.	27	do.
Bessemer Steel —		do.
Car Tender and Engine Axles,	37	do.
Locomotive Piston Rods, Plain,	37	do.
do. do. with Collar,	37	do.
do. Crank Pins,	37	do.
do. Connecting Rods,	37	do.
Frog Points and Plates,	37	do.
do. Side Bars,	37	do.

	PAGE.		RATE.
FORGINGS—			
Bessemer Steel —			
Marine Engine Cranks,	37		per lb.
do. Shafts,	37		do.
do. Connecting Rods,	37		do.
do. Cross Heads,	37		do.
do. Piston Rods,	37		do.
do. Beam Straps,	37		do.
do. Crank Pins,	37		do.
FORGES—			
Patterson's Patent,	111-112		Dis. from list.
Queen's do.	114-115		do. do.
Long Portable Pattern,	113		do. do.
FISH PLATES,	24		per ℔.
FISH PLATE BOLTS,	57	¾ and 1 3/16.	per ℔.
FLATTERS,	100		per ℔.
FULLERS,	100		per ℔.
FARRIER KNIVES,	107		per doz.
FELLOE PLATES,	200		per ℔.
FELLOES—			
Bent,	275		Dis. from list.
Sawed,	275		do. do.
FILES—			
Descriptive Plate,	127		
American,	128-129		Dis. from list.
Butcher's,	128-129		do. do.
FIFTH WHEELS—			
Nos. 1, 2, 3, 4, 5, 6,	184 to 187		Dis. from list.
FARRIERS' TOOLS—			
Hammers, with Handles,	107		Dis. from list.
Knives,	107		per doz.
Buttresses,	107		do.
Pinchers,	107		do.
Pritchels,	107		per lb.
GEARING—			
Wagon, Rough,	276-277		Dis. from list.
do. Finished and Oiled,	276		do. do.
Buggy, Rough,	278		do. do.
do. Finished and Oiled,	278		do. do.
HAMMERS—			
Cross Pane, Moss & Gamble,	99		per ℔.
do. American,	99		do.
Straight Pane, Moss & Gamble,	99		do.
do. American,	99		do.
Ball Pane, Moss & Gamble,	99		do.
do. American,	99		do.
Flogging, Moss & Gamble,	99		do.
do. American,	99		do.

HAMMERS —	PAGE.	RATE.
Riveting, Moss & Gamble,	99, 100	per lb.
do. American,	99, 100, 102	do.
Hand, Solid Cast Steel,	102	do.
Turning, do. do.	102	do.
Creasing, do. do.	102	do.
Drilling, C. Steel Face and Pane,	103	do.
do. Solid Cast Steel,	103	do.
Napping, C. Steel Face and Pane,	103	do.
do. Solid Cast Steel,	103	do.
Set, Moss & Gamble,	100	do.
do. American,	100	do.
Flatters, Moss & Gamble,	100	do.
do. American,	100	do.
Fullers, Moss & Gamble,	100	do.
do. American,	100	do.
Swages, Top, Moss & Gamble,	100	do.
do. do. American,	100	do.
do. Bottom, Moss & G.,	100	do.
do. do. American,	100	do.
Cupping Tools, Moss & Gamble,	100	do.
do. American,	100	do.
Cold Iron Cutters, Solid C. Steel,	102	do.
Hot do. do. do.	102	do.
Track Punch, Solid Cast Steel,	103	do.
do. Chisel, do. do.	103	do.
Hardies, do. do.	103	do.
Cold Chisels, do. do.	103	do.
Heading Tools, all sizes,	106	do.
Chipping, Masons, C. Steel Face,	105	do.
do. do. Solid C. Steel,	105	do.
Hand, do. C. Steel Face,	105	do.
do. do. Solid C. Steel,	105	do.
Post Maul, Cast Iron,	105	do.
Sledges, Cross Pane, Cast Steel,	104	do.
do. do. Solid C. Steel,	104	do.
do. Straight Pane, C. Steel,	104	do.
do. do. Solid,	104	do.
do. Turning, Cast Steel,	104	do.
do. do. Solid C. Steel,	104	do.
do. Striking, Solid C. Steel,	104	do.
do. Mason's, Cast Steel,	104	do.
do. do. Solid C. Steel,	104	do.
Spike Maul, Railroad, Solid,	105	do.
do. Boat, Solid C. Steel,	105	do.
Coal Maul, Solid Cast Steel,	105	do.
HAMMERS, WITH HANDLES —		
Straight Pane,	108	Dis. from list.
Cross do.	108	do. do.
Ball do.	108	do. do.
Riveting do.	106	do. do.
Farrier's,	107	do. do.
Blacksmith's,	108	do. do.

	PAGE.		RATE.
HORSE SHOES —			
Burden's,	42		per keg.
All Steel,	42		do.
HORSE NAILS —			
The Western, No. 10,	43		per lb.
The Countersunk, No. 10,	43		do.
Northwestern, No. 10,	43		do.
Length of,	43		
HORSE RASPS —			
Heller's,	322		Dis. from list.
HANGERS —			
For Shafting,	159	1 to 1¾ inch.	per lb.
do.	159	1⅞ to 2½ inch.	do.
do.	159	2½ to 3½ inch.	do.
HORSE SHOE CUSHIONS,	44		per doz. prs.
HARROW TEETH —			
Improved Pattern,	323	1 inch square.	per lb.
Common,	67	do.	do.
HAMMER STRAPS — Wrought,	182		per lb.
HUB BOXING MACHINES —			
Dole's Self-Centring,	149		Dis. from list.
Silver's do.	150 151		do. do.
do. Double Chuck Taper,	152-153		do. do.
Dole's Self-Centring Arm,	154		do. do.
HOLLOW AUGERS —			
Dole's,	158		Dis. from list.
Cutters for,	158		do. do.
Blanks do.	158		do. do.
HUB REAMERS —			
Hand Machine,	155		Dis. from list.
Power do.	324		do. do.
HUBS —			
Express and Buggy,	266		Dis. from list.
Wagon, Plain,	267		do. do.
do. Cupped,	267		do. do.
Sulky,	268		do. do.
Dray,	268		do. do.
Buggy, Eastern & Dayton Pat'rn,	269		do. do.
HANDLES —			
Gold Miners',	288		Dis. from list.
Sledge,	288		do. do.
Axe,	288		do. do.
Adze,	288		do. do.
Hammer,	288		do. do.
Coal Miner's,	289		do. do.
Railroad,	289		do. do.
Plow, Single Bend,	289		do. do.
do. Double do.	289		do. do.
HAWNS,	287		Dis. from list.

IRON —	PAGE.		RATE.
Flat Bar,	9	1½ to 4 × ⅜ to 1 in.	per ℔.
Round Bar,	10	1 to 1⅞ in. dia.	do.
Square Bar,	10	do. do.	do.
Shafting Bar, Extra Quality,	10		
Heavy Band,	9		
Light Tire,	9		
do. Band,	9		
Hoop,	9		
Charcoal Bars, Rods and Bands,	10		
Horse Shoe, "Stitt's,"	11		per ℔.
Ovals,	11		
Half Ovals,	11		
Half Rounds,	11		
Tongue Cap,	11		
Wagon Box,	11		
Sheet, Common, No. 10 to 17,	12	24 to 28 × 72 to 108 in.	per lb.
do. Juniata,	12		
do. Charcoal,	13		
do. Russia,	13	No. 16 to 12.	per lb.
do. Galvanized,	12		Dis. from list.
Tank,	13		per lb.
Boiler,	13		do.
Flange,	13		do.
Boiler Heads, Flanging,	13		do.
do. Not Flanging,	13		do.
Rail Chairs, Cast Iron,	24		do.
do. Wrought Iron,	24		do.
Forgings,	27		do.
Car Axles,	27		do.
Driving Axles,	27		do.
Truck do.	27		do.
Connecting Rods,	27		do.
Cranks,	27		do.
Crank Pins,	27		do.
Piston Rods,	27		do.
Steamboat Shafting,	27		do.
Mill do.	27		do.
Angle, Equal Sides,	14		do.
do. Unequal do.	15		do.
do. Double,	15		do.
do. Round Back,	16		do.
do. Acute,	16		do.
do. Obtuse, Equal,	16		do.
do. do. Unequal,	16		do.
Tee,	17		do.
Beam,	18, 19, 21		do.
Channel,	20, 21		do.
Flat Rails, Punched, Countersunk,	13		do.
Tee do. For Coal Roads,	13	18 to 28 lbs. per yard.	do.
Shingle Strips, Punched,	12		per keg.
Rails, Iron,	24		per ton.
do. Steel,	24		do.

	PAGE.		RATE.
IRON —			
Pig Iron, Scotch,	25		per ton.
do. American Charcoal,	25		do.
do. Anth. and Bit. Coal,	25		do.
Fish Plates,	24		per lb.
Fish Plate Bolts, Forged Thread,	24	$\frac{3}{4}$ in. and $\frac{1}{1}\frac{3}{6}$.	do.
Bridge Bolts,	24	1 to $2\frac{1}{4}$ in. dia., over 8 ft. long.	do.
Bolt Ends,	24	do. do. do.	do.
Turnbuckles,	24	$1\frac{1}{8}$ in. and larger.	do.
do.	24	$\frac{5}{8}$ each.	$\frac{1}{2}$ each.
NORWAY AND SWEDISH —			
Ordinary Sizes,	22	Norway, Swedish,	per lb.
Extra do.	22		do.
Rounds,	22		
Square,	23		
Shapes, Rerolled,	23		
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JACK SCREWS —			
Forged Thread,	251		Dis. from list.
KNIVES —			
Farrier's,	107		per doz.
KNEES AND BEAMS —			
Bent,	286		Dis. from list.
KING BOLTS —			
Plain,	188		Dis. from list.
Excelsior,	188		do. do.
King Bolt and Perch Bed Plate,	188		do. do.
LAG SCREWS —			
3 to 9 inches,	57	$\frac{3}{4}$ and $\frac{5}{8}$ in.	per lb.
LAP RINGS,	68	$\frac{5}{8}$ in.	per lb.
LINING BARS —			
Steel Pointed,	64		per lb.
Solid Steel,	64		do.

	PAGE.	RATE.
MOULD BOARDS —		
German Steel,	34-35	per lb.
Bessemer Steel,	34-35	do.
Cast do.	34-35	do.
MULE SHOES —		
Burden's,	42	per keg.
MANDRILS —		
Cast Iron,	251	Dis. from list.
MALLEABLE IRON —		
Whiffletree Ferrules,	202	per lb.
do. Tongues,	203	do.
do. Hooks,	204	do.
do. Circles,	205-206	do.
do. Plates,	207	do.
Hold Backs,	208	do.
Tee Irons,	209	do.
Corner Irons,	210	do.
Shaft Loops,	211	do.
Body do.	211	do.
Check do.	212	do.
Perch do.	212	do.
Footman's Loops,	212	do.
Axle Clips,	213	do.
do. and Shaft Coupling,	213	do.
Shifting Rail Iron,	214	do.
Spring Shackles,	214	do.
Hammer Straps,	214	do.
Double Tree Centre Irons,	214	do.
Single Tree do.	214	do.
Clevises, Double Tree,	215	do.
do. Shovel Plow,	215	do.
do. with Self-Adjusting Pin,	216	do.
do. Plow,	237 to 240	do.
Wear Irons,	217, 218, 219, 220	do.
Steps, Carriage,	221, 222, 223	do.
do. Sleigh,	224	do.
Thumb Nuts,	225	do.
Brake Holder,	225	do.
Axle Nuts,	226	do.
End Board Rod Nuts,	227	do.
do. Rod Washers,	228	do.
Stake Rings,	228	do.
Wagon Box Spring Iron,	228	do.
Hub Bands,	229	do.
Sand do.	230	do.
Wrenches,	231, 232	do.
Pole Yokes and Sockets,	233 to 236	do.
do. Crabs,	235	do.
Lathe Dogs,	241	do.
Chain Swivel,	241	do.
Hoe Eyes,	241	do.
Hay Fork Ferrules,	242	do.

	PAGE.		RATE,
MALLLEABLE IRON —			
Pump Rod Connections,	242		per lb.
Ladles, Melting,	242		do.
Shackle Holder,	242		do.
Rim Bands, Turned,	243		Dis. from list.
Seat Raisers,	244		do. do.
Trace Hook, Weller's,	244		per lb.
MONEY, WEIGHTS & MEASURES —			
Foreign,	307 to 320		
NAILS —			
Nails,	40	10 to 60d.	per keg.
Wrought Spikes,	41	$\frac{9}{16}$ to $\frac{3}{8}$ square.	do.
Railroad do.	41	$\frac{1}{2}$ and $\frac{9}{16}$.	per lb.
Length of,	41		
NUTS —			
Square, Cold Pressed,	45		Dis. from list.
do. Hot do.	45		do. do.
Machine Forged,	45		do. do.
Hexagon, Cold Pressed,	46		do. do.
do. Hot do.	46		do. do.
do. Hand Forged,	46		do. do.
NECK YOKES —			
Wagon,	280		Dis. from list.
Buggy,	280		do. do.
Express,	280		do. do.
OX YOKES —			
Ironed and Finished,	287		each.
OX BOWS,	287		per doz. prs.
PLOW STEEL —			
German,	34		per lb.
Bessemer,	34		do.
Cast,	34		do.
Cultivator Shovels, German,	34		do.
do. Bessemer,	34		do.
do. Cast,	34		do.
Mould Boards, German,	34-35		do.
do. Bessemer,	34-35		do.
do. Cast,	34-35		do.
Colter Plates, German,	35		do.
do. Bessemer,	35		do.
do. Cast,	35		do.
Plow Patches, German,	35		do.
do. Bessemer,	35		do.
do. Cast,	35		do.
PICKS —			
Coal Drifting, Washoe,	60		Dis. from list.
Coal Poll, do.	60		do. do.
Railroad, do.	60		do. do.
Tamping, do.	60		do. do.
Coal, do.	61		do. do.

	PAGE.		RATE.
PICKS —			
Gold Drifting, Washoe,	61		Dis. from list.
Gold Poll, do.	61		do. do.
Mattocks, do.	61		do. do.
Stone, do.	62		do. do.
Pick Axe, do.	62		do. do.
Ice, do.	62		do. do.
Slate, do.	62		do. do.
Mill, do.	62		do. do.
Pick Eyes, do.	63		do. do.
Stone, Common,	63		do. do.
Railroad, do.	63		do. do.
Steel for Pick Eyes,	63		per lb.
PINCH BARS —			
Plain Iron, Steel Pointed,	64		per lb.
Plain, Solid Steel,	64		do.
With Heel, Iron, Steel pointed,	64		do.
With Heel, Solid Steel,	64		do.
PULLEY BLOCKS,	72-73		Dis. from list.
PINCHERS,	107		per doz.
PRITCHELS,	107		per lb.
POST AUGERS,	251		Dis. from list.
PLANERS —			
Rose Patent,	148		Dis. from list.
PIPE BOXES —			
Reamed,	165		per lb.
POST MAULS,	105		per lb.
PIT BOLTS,	54		Dis. from list.
POLES —			
Rough,	279		Dis. from list.
Finished,	279		do. do.
RATCHETS —			
Bishop's Friction,	141		Dis. from list.
Packer's	141		do. do.
Packer's Boiler,	141		do. do.
Weston's,	142		do. do.
Moore's Triple Action,	143		do. do.
ROAD SCRAPERS —			
Steel Bottom,	66		each.
RAIL ROAD SPIKES,	41	½ and $\frac{9}{16}$.	per lb.
RAIL TONGS,	66		each.
RINGS —			
Beetle,	67		per lb.
RUBBER BUFFERS,	199		per lb.
RIVETS —			
Boiler,	48	⅝ and ¾.	per lb.
Tank,	48	⅜.	do.

	PAGE.		RATE.
RIVETS —			
Wagon and Carriage,	48	⅜.	per lb.
Wagon Nail,	49		do.
Cooper's D,	49	In bulk.	
do. Lb.,	49	do.	
do. Lb.,	50	In papers, 8 oz.	per M.
Countersunk, Agricultural,	50	Nos. 3 and 4.	per lb.
RUBBER ANTI-RATTLERS —			
Shaft Rubbers, Plain,	198		Dis. from list.
Shaft do. Central Park,	198		do. do.
STEEL —			
Cast Steel, Extra,	29	Importation List.	per lb.
do. Best,	29	do. do.	do.
do. 2d Quality,	29	do. do.	do.
do. 3d do.	29	do. do.	do.
do. 4th do.	29	do. do.	do.
Machinery,	29	do. do.	do.
Swaged Cast,	29	do. do.	do.
Shear, Best Double,	29	do. do.	do.
do. do. Single,	29	do. do.	do.
Blister, 1st Quality Swedish,	29	do. do.	do.
do. 2d do.	29	do. do.	do.
do. 3d do.	29	do. do.	do.
German, Best Quality,	29	do. do.	do.
do. 2d do.	29	do. do.	do.
do. 3d do.	29	do. do.	do.
Sheet, Best Quality,	29	do. do.	do.
do. 2d do.	29	do. do.	do.
do. 3d do.	29	do. do.	do.
Shovel, Best,	29	do. do.	do.
do. Common,	29	do. do.	do.
Hoe Sheet,	29	do. do.	do.
Mill Saw,	29	do. do.	do.
Billet Web,	29	do. do.	do.
Cross Cut Saw,	29	do. do.	do.
Circular do.	29	do. do.	do.
Toe Calk, Best Quality,	29	do. do.	do.
do. Common,	29	do. do.	do.
Spring, Best Quality Swedish,	29	do. do.	do.
do. 2d do.	29	do. do.	do.
do. 3d do.	29	do. do.	do.
do. Cast,	29	do. do.	do.
Tire,	29	do. do.	do.
Sleigh Shoe,	29	do. do.	do.
Plow, German,	29	do. do.	do.
do. Cast,	29	do. do.	do.
do. Bessemer,	30	do. do.	do.
Cultivator Blades, German,	30	do. Cut to pattern.	do.
do. Bessemer,	30	do. do.	do.
do. Cast,	30	do. do.	do.
Colter Plates, German,	30	do. do.	do.

STEEL —	PAGE.	Importation List.		RATE.
Colter Plates, Bessemer,	30	do.	Cut to pattern.	per lb.
do. Cast,	30	do.	do.	do.
Mould Boards, German,	30	do.	do.	do.
do. Bessemer,	30	do.	do.	do.
do. Cast,	30	do.	do.	do.
Plow Plates, German,	30	do.	do.	do.
do. Bessemer,	30	do.	do.	do.
do. Cast,	30	do.	do.	do.
Fork,	30	do.	do.	do.
Rake,	30	do.	do.	do.
Roller and Spindle,	30	do.	do.	do.
Cutter and Finger Bar,	30	do.	do.	do.
Slide Bar,	30	do.	do.	do.
Scraper,	30	do.	do.	do.
Wire Rod,	30	do.	do.	do.
Soft Centre, for Taps,	30	do.	do.	do.
Skate,	30	do.	do.	do.
Cutlery,	30	do.	do.	do.
File,	30	do.	do.	do.
Rasp,	30	do.	do.	do.
Rail Frogs, made to pattern,	30	do.	do.	do.
Railway Car Spring,	30	do.	do.	do.
do. Axle,	30	do.	do.	do.
Rails,	24	do.	do.	per ton.
ENGLISH, CAST —				
Square, Common Sizes,	31			per lb.
Octagon, do.	31			do.
Round, do.	31			do.
Flats, do.	31			do.
Square, Extra Sizes,	31			
Octagon, do.	31			
Round, do.	31			
Flats, do.	32			
AMERICAN, CAST —				
Square, Common Sizes,	32			per lb.
Octagon, do.	32			do.
Round, do.	32			do.
Flats, do.	32			do.
Square, Extra Sizes,	32			
Octagon, do.	32			
Round, do.	32			
Flats, do.	32			
Circular Saw,	33			per lb.
Toe Calk,	33	$\frac{3}{8}$ sq. and larger.		do.
Manufacture of,	294 to 295			
STEEL SPRING —				
Jenks',	33	$1\frac{1}{4}$ to 6 × $\frac{3}{16}$ to $\frac{1}{2}$.		per lb.
STEEL TIRE —				
Jenks',	33	$1\frac{1}{4}$ to 1 × $\frac{3}{16}$ to $\frac{5}{16}$.		per lb.
Bessemer,	33	do.	do.	do.
Cast,	33	do.	do.	do.
Mixed,	33	do.	do.	do.

	PAGE.		RATE.
SLEIGH SHOE STEEL —			
Sleigh Shoe,	33	⅞ to 1½ wide, any thickness.	per lb.
Cutter and Sleigh Shoe, Tapered,	36	2 × ¾	do.
STEEL, BESSEMER —			
Rounds, Common Sizes,	36	1 to 2¾.	per lb.
Squares, do.	36	do.	do.
Flats, do.	36	1¼ to 4 × ⅜ to 1.	do.
Heavy Band,	36		
Light do.	37		
Hoop,	37		
Oval,	37		
Half Oval,	37		
Half Round,	37		
Car Tender and Engine Axles,	37	Plain.	do.
Locomotive Piston Rods, Plain,	37		do.
do. do. with Collar,	37		do.
do. Crank Pins,	37		do.
do. Connecting Rods,	37	Usual style.	do.
Frog Points and Plates,	37		do.
do. Side Bars,	37		do.
Plain Forgings,	37	500 to 1,000 lbs.	do.
Marine Engine Cranks,	37		do.
do. Shafts,	37		do.
do. Connecting Rods,	37		do.
do. Cross Heads,	37		do.
do. Piston Rods,	37		do.
do. Beam Straps,	37		do.
do. Crank Pins,	37		do.
STEEL, WITH IRON CENTRE —			
Round, Common Sizes,	38	1 to 2½ in.	per lb.
Square, do.	38	do.	do.
Flats, do.	38	1½ to 4 × ⅜ to 1.	do.
Ovals,	38		
Half Ovals,	38		
Half Rounds,	38		
SHAFTING, FINISHED —			
Iron, Polished,	26		Dis. from list.
Steel Surfaced, Polished,	26		do. do.
Cast Steel, do.	27		do. do.
SPIKES —			
Railroad,	24	9/16 ½	per lb.
Cut,	41		
SPOKE TENONING MACHINE —			
Dole's,	156-157		Dis. from list.
SPOKE POINTER,	148		Dis. from list.
SPOKES —			
All White Second Gr. Hickory,	270		Dis. from list.
Mixed, do. do.	270		do. do.
All White Selected Hickory,	270		do. do.
Red Forest Hickory,	271		do. do.
Mixed or White Forest Hickory,	271		do. do.

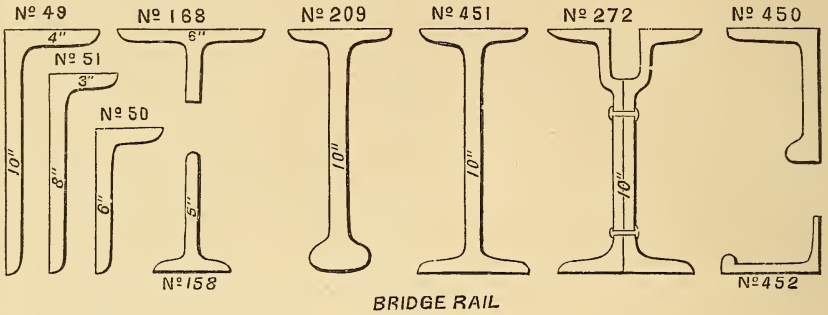
	PAGE.		RATE.
SPOKES —			
No. 1 Forest Hickory,	271		do. do.
Sulky, All White Sec. Gr. Hick.,	272		do. do.
do. Forest Hickory,	272		do. do.
Second Growth Oak,	273		do. do.
H., K. & Co., Selected Oak,	273		do. do.
XXX, Oak,	273		do. do.
XX, do.	274		do. do.
No. 1, do.	274		do. do.
SPRINGS —			
Descriptive Plates,	166-167		
Seat, Jenks' Blue, 2 leaves,	168	Ordinary lots.	Dis. from list.
do. do. 3 do.	168	do.	do. do.
Carriage, Common,	169		per lb.
do. Tempered,	169		do.
do. Oil Tempered,	169		do.
do. Swedish Steel, Oil T.,	169		do.
Express, Tempered,	170		do.
do. Oil Tempered,	170		do.
do. Swedish Steel, Oil T.,	170		do.
Clipper, Lewis' Patent,	171		do.
Sulky, Oil Tempered,	171		do.
Half Springs, Tempered,	172		do.
do. Oil Tempered,	172		do.
do. Swedish Steel, O.T.	172		do.
Side Spring, Tempered,	172		do.
do. Oil Tempered,	172		do.
do. Swedish Steel, O.T.,	172		do.
SHINGLE STRIPS —			
Punched,	12		per keg.
SPRING HOLDER,	323		Dis. from list.
SHAFT COUPLINGS —			
Plain,	190		Dis. from list.
Clip Bar,	190		do. do.
Improved,	191		do. do.
Straight Ear,	191		do. do.
Central Park,	192		do. do.
Clapp's Patent,	193		do. do.
Derby,	193		do. do.
Pole Eyes, Plain,	192		do. do.
do. Reversed Pattern,	192		do. do.
SLEIGH SHOES —			
Common Pattern,	180		per lb.
Lockwood & Frederick's,	180		Dis. from list.
SLEIGH BOLTS,	53		Dis. from list.
STAPLES, Wagon Body,	183		Dis. from list.
SINGLETREE PLATES, Wrought,	182		per lb.
STOCKS AND DIES,	130		Dis. from list.
SPRING BAR CLIPS,	195		Dis. from list.

	PAGE.		RATE.
SCALES —			
Fairbanks',	252		Dis. from list.
SADDLE CLIPS,	196		Dis. from list.
SEAT RAISER,	244		Dis. from list.
SPOONS, For Stone,	65		each.
SWAGE BLOCK,	109		per lb.
SWAGES —			
Top, Moss & Gamble,	100		per lb.
do. American,	100		do.
Bottom, Moss & Gamble,	100		do.
do. American,	100		do.
SET HAMMER, Moss & Gamble.	100		per lb.
American,	100		do.
SHOES —			
Horse, Burden's,	42		per keg.
Mule, do.	42		do.
Steel,	42		per lb.
SCREWS —			
Iron, Gimlet Pointed.	58		Dis. from list.
Brass, do.	59		do. do.
Iron, Machine,	59		do. do.
Coach, Gimlet Pointed,	57	$\frac{5}{8}$.	per lb.
SKEIN BOLTS,	57	$\frac{3}{4}$ and $\frac{5}{8}$.	per lb.
SLAT IRONS —			
Wrought,	245		Dis. from list.
Philadelphia,	245		do. do.
STEP PADS —			
Star Pattern,	200, 249		Dis. from list.
X do.	250		do. do.
Ribbed,	250		do. do.
SPRING BUFFERS, Rubber,	199		per lb.
SHAFT BOLTS —			
Diamond Head,	197		Dis. from list.
T do.	197		do. do.
SEATS —			
Topliff & Ely's Patent,	282		Dis. from list.
Hubbell's, "	282		do. do.
Graham's, "	283		do. do.
Pieced Back,	283		do. do.
Rails, Solid Bent Board,	283		do. do.
SINGLETREES —			
Express,	281		Dis. from list.
Buggy,	281		do. do.
Round,	281		do. do.
Oval,	281		do. do.
SAWED FELLOES,	275		Dis. from list.
STUMP JOINTS,	246		Dis. from list.

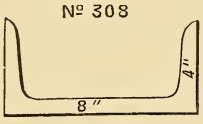
	PAGE.		RATE.
SHAFTS —			
Rough,	279		Dis. from list.
Finished and Oiled,	279		do. do.
THIMBLE SKEINS —			
Chicago,	174		Dis. from list.
Dundee,	175, 178		do. do.
Kenosha,	176		do. do.
Seneca Falls,	177		do. do.
Turned and Fitted,	179		do. do.
TUYER IRONS —			
Monitor,	118, 119		Dis. from list.
Duck's Nest, Single,	120		do. do.
do. Double,	120		do. do.
do. with Slide,	120		do. do.
Dole's Patent, Water,	120		do. do.
Globe Head,	121		do. do.
Norton's Patent,	121		do. do.
Serpentine Wind Worm,	122		do. do.
Clark's Patent,	123 to 126		do. do.
TIRE SHRINKERS —			
Wirt's Patent,	145		Dis. from list.
Olmstead & Dinsmore's,	145		do. do.
Rose's Patent,	146-147		do. do.
TIRE BENDERS —			
Common,	144		Dis. from list.
Improved,	144		do. do.
TURNBUCKLE BOLTS —	57	1⅛ and larger,	per lb.
do. do.	57	⅝ ½	each.
TAMPING BARS —			
Iron, Steel Pointed,	64		per lb.
Solid Steel,	64		do.
TONGS —			
Blacksmith,	106		per lb.
Rail,	66		each.
TOP PROPS,	246		Dis. from list.
TOE CALKS,	44		per lb.
TRACK PUNCH,	103		per lb.
TRACK CHISEL,	103		per lb.
TAPS —			
Taper,	131		Dis. from list.
Plug,	131		do. do.
TRACE HOOKS —			
Weller's,	244		per lb.
TIRE BOLTS —			
Common,	53		Dis. from list.
R. B. & W.,	53		do. do.

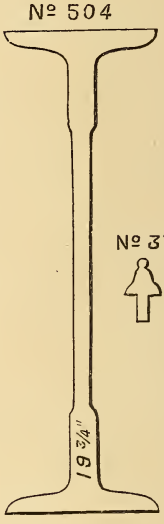
	PAGE.		RATE.
TUBES —			
Wrought Iron, Polished,	27		Dis. from list.
TONGUE CAPS —			
Wrought,	182		per lb.
VISES —			
Peter Wright's Solid Box,	75		per lb.
Hall, Kimbark & Co.'s Solid Box,	75		do.
Ordinary Make, do.	75		do.
Parker's Parallel,	76 to 79		Dis. from list.
do. Swivel,	80 to 82		do. do.
do. Woodworker's,	82		do. do.
do. Oval Slide,	83 to 85		do. do.
do. Round D'ble Swivel,	86 to 88		do. do.
Hurlburt's Swivel,	89		do. do.
Tate's Wrought Iron,	90 to 92		do. do.
Stephens',	93		do. do.
Hoar's,	94 to 96		do. do.
Backus',	97 to 98		do. do.
Hand and Drill Chuck,	135		do. do.
Box and Screw,	75	30 to 40 lbs.	each.
WEDGES —			
Woodchoppers', Iron,	67	Fluted.	per lb.
do. Steel,	67	do.	do.
Coal Miners', do.	67		do.
WRENCHES —			
Lindsay's Patent,	132		Dis. from list.
Coe's do. Genuine,	133		do. do.
do. do. Imitation,	133		do. do.
Taft's do.	133		do. do.
Baxter's do.	133		do. do.
Brace,	134		do. do.
Bit Brace,	134		do. do.
Adjustable, Malleable,	232		do. do.
Moore's Triple Action,	143		do. do.
WAGON HARDWARE —			
Tongue Cap Irons, Wrought,	182		per lb.
Hammer Strap, do.	182		do.
Double Tree Plates, do.	182		do.
Single Tree do. do.	182		do.
Wagon Box Strap Bolts,	183		Dis. from list.
do. Staples,	183		do. do.
End Board Nuts and Washers,	323	Wrought Iron.	per lb.
Whiffletree Hooks,	201		Dis. from list.
End Board Rod,	183	Narrow track.	per 100 rods.
do. do.	183	Wide do.	do. do.
Whiffletree Bolts,	196		Dis. from list.
Whip Sockets, Chamberlin's,	199		do. do.
WHIFFLETREE PLATES —			
Brewster's Patent,	201		Dis. from list.
Pennoyer's do.	248		do. do.
Clark's do.	248		do. do.

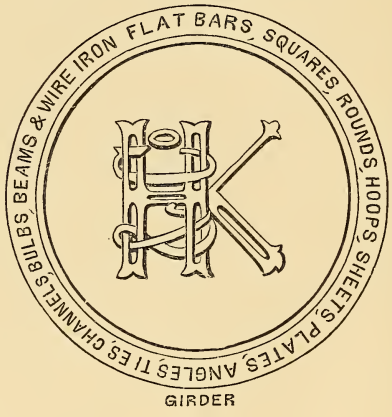
	PAGE.	RATE.
WHEELS —		
Carriage, White Sec. Gr. Timber,	260	Dis. from list.
do. Selected Timber,	260	do. do.
Sulky, White Sec. Gr. Timber,	260	do. do.
Sterrick's Patent,	261, 262, 263	do. do.
Sarven's do.	264, 265	do. do.
WAGON GEARING —		
Rough, 11 pieces,	276	Dis. from list.
Finished and Oiled, 16 pieces,	276	do. do.
Hickory Axles, Rough,	277	do. do.
WAGON TONGUES,	277	Dis. from list.
do. Reaches,	277	do. do.
do. Bolsters,	277	do. do.
do. Sand Boards,	277	do. do.
WASHERS,	47	Dis. from list.
WROUGHT IRON WELDED TUBES,	27	Dis. from list.
WAGON BODIES,	253 to 259	Dis. from list.
WHEELBARROWS —		
Canal,	66, 290	per doz.
Garden,	66, 290	do.
Railroad,	66, 290	do.
WHIP SOCKETS,	199	Dis. from list.
WHIFFLETREE HOOKS,	201	Dis. from list.
WOOD —		
Selection, quality, etc.	295 to 297	
WEIGHTS, MONEY & MEASURES —		
Foreign,	307 to 320	



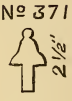
BRIDGE RAIL

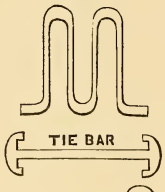


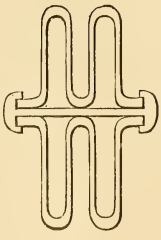


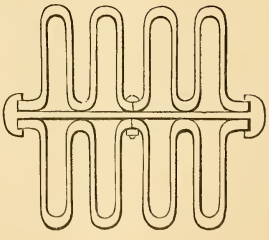


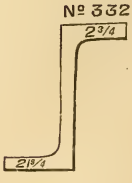
GIRDER

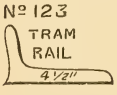












MONTGOMERY'S PATENT BEAMS

SCALE 8"

IRON.

Extras hereinafter named are to be added to rate quoted for ordinary sizes bar iron.

FLAT BAR.

									Rate.	
1½	to	4	×	⅜	to	1	inch,			
4¼	to	6	×	⅜	to	1	inch,		¼	cent per ℔ extra.
2	to	4	×	1⅛	to	1½	inch,		¼	do.
4¼	to	6	×	1⅛	to	1½	inch,		½	do.
1⅛	to	1⅜	×	⅜	to	¾	inch,	Dandy	¼	do.
⅞	to	1	×	⅜	to	¾	inch,	Tire.	½	do.

All iron cut to specified lengths, except "Tire sizes," ¼ cent per ℔ extra.

HEAVY BAND AND LIGHT TIRE.

2	to	4	×	3/16	to	5/16	inch,	¾	cent per ℔ extra.
4⅛	to	6	×	3/16	to	5/16	inch,	1	do.
1½	to	1⅞	×	3/16	to	5/16	inch,	1	do.
⅞	to	1⅜	×	3/16	to	5/16	inch,	1¼	do.
½	to	¾	×	3/16	to	5/16	inch,	1½	do.

All "Band" cut to specified lengths ¾ cent per ℔ extra.

LIGHT BAND AND HOOPS.

2¼	to	3	inch,		1¼	cent per ℔ extra.
3⅛	to	4¾	inch,		1½	do.
5	to	6	inch,		1¾	do.
1¾	to	2	inch,		1½	do.
1½			inch,		1¾	do.
1⅛	and	1¼	inch,	up to No. 20 gauge,	2	do.
1			inch,	up to No. 20 gauge,	2½	do.
⅞			inch,	up to No. 21 gauge,	3¾	do.
¾			inch,	up to No. 22 gauge,	4¾	do.
⅝			inch,	up to No. 22 gauge,	5¾	do.

All "Hoop" cut to specified lengths, ¾ cent per ℔ extra.

ROUND AND SQUARE.

1	to 1 7/8	inch,	- - - -		
2	to 2 3/4	inch,	- - -	1/4	cent per lb extra.
3	to 3 1/2	inch,	- - - -	1/2	do.
3 3/4	to 4	inch,	- - -	1	do.
3/4	to 7/8	inch,	- - - -	1/4	do.
9/16	to 5/8	inch,	- - -	1/2	do.
3/8	to 1/2	inch,	- - - -	3/4	do.
5/16		inch,	- - -	1 1/4	do.
1/4		inch,	- - - -	1 3/4	do.
3/16		inch,	- - -	4	do.

N. B. No squares above 4 inches. All iron cut to exact lengths, 1/2 cent extra.

SHAFTING IRON, EXTRA QUALITY.

2	to 2 3/4	inch,	- - -	1/2	cent per lb extra.
2 7/8	to 3 1/2	inch,	- - - -	3/4	do.
3 5/8	to 4	inch,	- - -	1 1/4	do.
4 1/8	to 4 1/2	inch,	- - - -	1 1/2	do.
4 5/8	to 5	inch,	- - -	1 3/4	do.
5 1/4	to 5 1/2	inch,	- - - -	2 1/4	do.
5 3/4	to 6	inch,	- - -	2 3/4	do.
6 1/4	to 6 1/2	inch,	- - - -	3 1/4	do.

N. B. No squares above 4 inches. All iron cut to exact lengths, 1/2 cent extra.

Charcoal Bars, Rods and Bands, 2 cents extra over rates quoted for same sizes ordinary iron.

NAIL RODS, Slit.

3/8 × 3/16
5/16 × 3/16
1/4 × 3/16
} Extra Quality Norway

NAIL RODS, Rolled.

3/8 × 3/16
13/32 × 3/16
7/16 × 3/16
15/32 × 3/16
} For Machine Made Hm'd Nails.

We have constantly in store a large stock of the very best grades of Slit and Rolled Rods. Orders executed promptly.

HORSE SHOE.

Stitt's Best, branded with *Axe* and *Horse Shoe.*

$\frac{5}{8}$ × $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$
$\frac{3}{4}$ × $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$
$\frac{7}{8}$ × $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$
1 × $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ and $\frac{5}{8}$.
$1\frac{1}{8}$ × $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ and $\frac{5}{8}$.
$1\frac{1}{4}$ × $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$ and $\frac{5}{8}$.

Having been agents for the above popular brand of Horse Shoe Iron for the past fifteen years, we offer it to our trade with confidence, and knowing its superiority over most other brands, guarantee the quality. We are prepared to fill orders from stock, or receive orders for importation.

OVAL.

$\frac{7}{8}$	to	$1\frac{1}{4}$,	$\frac{1}{2}$	cent per ℔ extra.
$\frac{5}{8}$	to	$\frac{3}{4}$,	$\frac{3}{4}$	do.
$\frac{1}{2}$			1	do.
$\frac{3}{8}$			$1\frac{1}{4}$	do.

HALF OVAL.

$\frac{7}{8}$	to	$1\frac{1}{4}$,	$\frac{3}{4}$	cent per ℔ extra.
$\frac{5}{8}$	to	$\frac{3}{4}$,	$1\frac{1}{4}$	do.
$\frac{1}{2}$			$1\frac{1}{2}$	do.
$\frac{3}{8}$			$1\frac{3}{4}$	do.

HALF ROUND.

$\frac{7}{8}$	to	$1\frac{1}{4}$,	$\frac{3}{4}$	cent per ℔ extra.
$\frac{5}{8}$	to	$\frac{3}{4}$,	$1\frac{1}{4}$	do.
$\frac{1}{2}$			$1\frac{1}{2}$	do.
$\frac{3}{8}$			$1\frac{3}{4}$	do.

TONGUE CAP.

$2\frac{1}{4}$	×	No. 12	Bevel Edges,	$1\frac{3}{4}$	cents per ℔ extra.
$1\frac{3}{4}$	×	2	do.	2	do.

WAGON BOX.

$\frac{7}{8}$	×	No. 12,	10′ 10′.6″ 11′	$3\frac{3}{4}$	cents per ℔ extra.
$\frac{3}{4}$	×	No. 12,	do. do.	$4\frac{3}{4}$	do.
$\frac{5}{8}$	×	No. 12,	do. do.	$5\frac{3}{4}$	do.

The above sizes also in scroll.

PATENT PUNCHED SHINGLE STRIPS.

$\frac{5}{8}$ and $\frac{3}{4}$ inch wide, any length required, - - - per keg.

SHEET IRON, Common.

No. 10 to 17,	24 to 28 in. wide ×	72 to 108 in. long,	
" 18 to 24,	do.	do.	$\frac{1}{2}$ cent per ℔ extra.
" 25 to 26,	do.	do.	$\frac{3}{4}$ do.
" 27	do.	do.	1 do.
" 28	do.	do.	$1\frac{1}{4}$ do.
" 29	do.	do.	$1\frac{3}{4}$ do.
" 30	do.	do.	$1\frac{3}{4}$ do.

All sheets over 28 inches wide, or cut to pattern, $\frac{1}{2}$ cent per ℔ extra.

GALVANIZED SHEET IRON.

No. 10 and 12, 24 to 32 in. wide × 72 to 96 in. long, made to order.

" 14, 15, 16 " 17, 18, 19, 20	do.	do.	15 cents per ℔.
" 21, 22, 23, 24,	do.	do.	16 do.
" 25, 26,	do.	do.	17 do.
" 27,	do.	do.	18 do.
" 28,	do.	do.	20 do.
" 29,	do.	do.	22 do.

Less discount.

ADDITIONAL PRICES ON EXTRA SIZES.

No. 18 to 20 × 32 to 36 wide, - -	$\frac{1}{2}$ cent per ℔ extra.
" 18 to 20 × 38 to 44 wide, - -	$\frac{3}{4}$ do.
" 22 to 24 × 32 to 36 wide, - -	$\frac{3}{4}$ do.
" 22 to 24 × 38 to 44 wide, - -	$1\frac{1}{2}$ do.
" 25 to 26 × 36 × 72 wide, - -	1 do.
Over 96 in. long, and not over 108 in. -	$\frac{1}{2}$ do.
Over 108 in. long, and not over 120 in. -	1 do.
Under 24 in. wide, extra.	

JUNIATA SHEET.

No. 10 to 17, -	$3\frac{3}{4}$ cents over	common sheets,	same gauge.	
" 18 to 24, - -	$3\frac{3}{4}$	do.	do.	do.
" 25 to 26, -	$3\frac{3}{4}$	do.	do.	do.
" 27, - -	$3\frac{3}{4}$	do.	do.	do.
" 28, -	$3\frac{3}{4}$	do.	do.	do.

CHARCOAL SHEET.

No. 10 to 17, - 1¾ cents over common sheets, same gauge.
" 18 to 24, - - 1¾ do. do. do.
" 25 to 26, - 1¾ do. do. do.
" 27, - - 1¾ do. do. do.
" 28, - 1¾ do. do. do.

RUSSIA SHEET, Genuine—Usual Sizes.

No. 16, 15½, 15, 14½, 14, 13½, 13, 12½,
" 12, 11½, 11, 10½, 10, 9½, 9, 8½, 8,
Price - - -

No. 16 to 12, - - - Common sizes.
" 11, - - - 1 cent extra above do.
" 10, - - - - 1 do. do.
" 9, - - - 2 do. do.
" 8, - - - - 3 do. do.

The numbers give the approximate weight per sheet, viz.: No. 12 weighs about 12 lbs. per sheet.

TANK.

3/16 to ¾, - - - - - - - per lb.

BOILER.

3/16 to ¾, - - - - - - - per lb.

FLANGE.

3/16 to ¾, - - - - - - - per lb.

BOILER HEADS.

Flanging, - - - - - - - per lb.
Not flanging, - - - - - - - do.

FLAT RAILS, Punched and Countersunk.

1½ to 2 × ½ to ⅝, - - ½ cent extra above iron rates.
1½ × ⅜ and 7/16, - - - ¾ do. do.
1¼ × ⅜ and 7/16, - - - 1 do. do.
1¼ × ¼ and 5/16, - - - 1½ do. do.

TEE RAILS—For Coal Roads.

18 lbs. to 28 lbs. to the yard, - - - per lb.
16 - - - ¼ cent extra do.
10 to 12 - - ¾ do. do.
8 - - - 1¼ do. do.

ANGLE IRON.

We have on file in our office sectional drawings of over one thousand Beams, Bulbs, Angles, Tees, Channels, and other irregular shaped Iron, adapted to all purposes of construction, including buildings, ships, bridges, and all descriptions of engineering and agricultural work.

We are prepared to import them on the most favorable terms, and guarantee quality and prompt shipments. We annex list of several hundred of leading sizes.

ANGLE IRON, Equal Sides—Importation List.

$\frac{5}{8}$	×	$\frac{5}{8}$	×	$\frac{1}{8}$				inch.
$\frac{3}{4}$	×	$\frac{3}{4}$	×	$\frac{1}{8}$				do.
$\frac{7}{8}$	×	$\frac{7}{8}$	×	$\frac{1}{8}$	@	$\frac{1}{4}$		do.
1	×	1	×	$\frac{1}{8}$	@	$\frac{1}{4}$		do.
$1\frac{1}{8}$	×	$1\frac{1}{8}$	×	$\frac{1}{8}$	@	$\frac{1}{4}$		do.
$1\frac{1}{4}$	×	$1\frac{1}{4}$	×	$\frac{1}{8}$	@	$\frac{5}{16}$		do.
$1\frac{3}{8}$	×	$1\frac{3}{8}$	×	$\frac{1}{8}$	@	$\frac{3}{8}$		do.
$1\frac{1}{2}$	×	$1\frac{1}{2}$	×	$\frac{1}{8}$	@	$\frac{3}{8}$		do.
$1\frac{5}{8}$	×	$1\frac{5}{8}$	×	$\frac{1}{8}$	@	$\frac{3}{8}$		do.
$1\frac{3}{4}$	×	$1\frac{3}{4}$	×	$\frac{1}{8}$	@	$\frac{3}{8}$		do.
$1\frac{7}{8}$	×	$1\frac{7}{8}$	×	$\frac{1}{8}$	@	$\frac{3}{8}$		do.
2	×	2	×	$\frac{3}{16}$	@	$\frac{7}{16}$		do.
$2\frac{1}{8}$	×	$2\frac{1}{8}$	×	$\frac{3}{16}$	@	$\frac{7}{16}$		do.
$2\frac{1}{4}$	×	$2\frac{1}{4}$	×	$\frac{3}{16}$	@	$\frac{7}{16}$		do.
$2\frac{1}{2}$	×	$2\frac{1}{2}$	×	$\frac{1}{4}$	@	$\frac{1}{2}$		inch.
$2\frac{5}{8}$	×	$2\frac{5}{8}$	×	$\frac{1}{4}$	@	$\frac{1}{2}$		do.
$2\frac{3}{4}$	×	$2\frac{3}{4}$	×	$\frac{1}{4}$	@	$\frac{9}{16}$		do.
3	×	3	×	$\frac{1}{4}$	@	$\frac{5}{8}$		do.
$3\frac{1}{4}$	×	$3\frac{1}{4}$	×	$\frac{3}{8}$	@	$\frac{3}{4}$		do.
$3\frac{1}{2}$	×	$3\frac{1}{2}$	×	$\frac{3}{8}$	@	$\frac{3}{4}$		do.
$3\frac{3}{4}$	×	$3\frac{3}{4}$	×	$\frac{3}{8}$	@	$\frac{3}{4}$		do.
4	×	4	×	$\frac{3}{8}$	@	$\frac{3}{4}$		do.
$4\frac{1}{2}$	×	$4\frac{1}{2}$	×	$\frac{1}{2}$	@	$\frac{3}{4}$		do.
$4\frac{3}{4}$	×	$4\frac{3}{4}$	×	$\frac{5}{8}$	@	$\frac{3}{4}$		do.
5	×	5	×	$\frac{5}{8}$	@	1		do.
$5\frac{1}{2}$	×	$5\frac{1}{2}$	×	$\frac{5}{8}$	@	1		do.
6	×	6	×	$\frac{5}{8}$	@	1		do.

ANGLES, Unequal Sides—Importation List.

10 × 4 × ½ @ 13/16
10 × 3½ × ½ @ 13/16
8¾ × 1⅝ × 5/16 @ ⅜
8 × 4½ × ⅜ @ ¾
8 × 4 × ½ @ 13/16
8 × 3½ × ½ @ 13/16
8 × 3 × ⅝ @ ¾
8 × 2½ × 7/16
7 × 4 × ½ @ 13/16
7 × 3½ × 7/16 @ ¾
6½ × 5½ × ¾
6½ × 4 × 7/16 @ ¾
6½ × 1⅝ × 5/16 @ ⅜
6 × 4½ × 7/16 @ ¾
6 × 4 × 7/16 @ ¾
6 × 3½ × ⅜ @ 11/16
6 × 3 × ⅜ @ 11/16
5½ × 4½ × ¾
5½ × 4 × 7/16 @ ¾
5½ × 3½ × ⅜ @ 11/16
5½ × 3 × ¾
5½ × 2⅜ × ⅝
5 × 4½ × 7/16 @ ¾
5 × 4 × 7/16 @ ¾
5 × 3½ × 7/16 @ ¾
5 × 3¼ × ½ @ 11/16
5 × 3 × ⅜ @ 11/16
4½ × 4 × ⅜ @ 7/16
4½ × 3½ × ½ @ 11/16
4½ × 3 × 5/16 @ 11/16

4 × 3½ × 5/16 @ ⅝
4 × 3 × 5/16 @ ⅝ and ⅞
4 × 2½ × ¼ @ ½
4 × 2¼ × ⅜ @ ½
4 × 2 × 5/16 @ ½
3¾ × 2¾ × 5/16 @ ⅝
3½ × 3 × 5/16 @ ⅝
3½ × 2½ × 5/16 @ ⅝
3½ × 1½ × ⅜ @ ½
3¼ × 2¼ × ⅜ @ ⅝
3¼ × 2 × ¼ @ ½
3 × 2¾ × 3/16 @ ½
3 × 2½ × ¼ @ ⅝
3 × 2 × 3/16 @ ½
3 × 1½ ¼ × @ ⅜
2¾ × 1⅛ × 3/16 @ 5/16
2¾ × 2 × ¼ @ ⅜
2½ × 2 × ¼ @ ½
2½ × 1½ × 3/16 @ 5/16
2¼ × 2 × ¼ @ ⅜
2¼ × 1¾ × 3/16 @ 7/16
2 × 1¾ × ¼ @
2 × 1½ × 3/16 @ 7/16
2 × 1 × ¼ @ ⅜
1¾ × 1¼ × 3/16 @ 5/16
1¾ × 1 × 3/16 @ 5/16
1½ × 1¼ × 3/16 @ 5/16
1½ × ¾ × 3/16 @ 7/16
1⅜ × 9/16 × 3/16

DOUBLE ANGLES.

3¼ × 6½ × 3¼ × ½
2¾ × 6 × 2¾ × ½
2½ × 4¼ × 2½ × ⅜

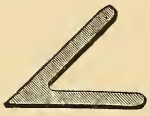
2½ × 4 × 2½ × ⅜
1½ × 3½ × 2¼ × ⅜
2 × 2½ × 2 × 5/16 @ 7/16

ROUND BACK ANGLES—Importation List.

5 × 5 × 1, 1⅛ and 1¼
3¼ × 3¼ × ¼ @ ½
3 × 3 × ¼ @ ½
2 9/16 × 2 9/16 × ⅜ @ ½
2½ × 2½ × ¼ @ ½
2¼ × 2¼ × ¼ @ ½

2 × 2 × 5/16 @ 7/16
1¾ × 1¾ × ¼
1½ × 1½ × ¼
1¼ × 1¼ × ¼
1 × 1 × ¼

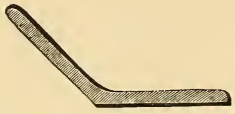
ACUTE ANGLES.



4 × 3½ × ⅜ @ ½

3 × 3 × ¼ @ ¾

OBTUSE ANGLES, Unequal Sides.



5 × 3½ × ⅜ @ ⅝
3¾ × 2 × ⅜ @ ½

3¼ × 2 × ⅜ @ ½
3 × 2 × 5/16 @ ½

OBTUSE ANGLES, Equal Sides.

5 × 5 × ½ @ ¾
3½ × 3½ × ⅜ @ ¾
3¼ × 3¼ × 5/16 @ ⅝
3 × 3 × ¼ @ ¾

2¾ × 2¾ × ¼ @ ⅝
2½ × 2½ × ¼ @ ⅝
2¼ × 2¼ × 3/16 @ ½
2 × 2 × 3/16 @ 7/16

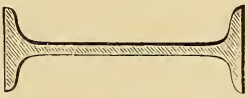
TEE IRON—Importation List.

TOP TABLE.	WEB.	THICKNESS. TABLE.	THICKNESS. WEB.	NO. OF SECT'NS.	TOP TABLE.	WEB.	THICKNESS. TABLE.	THICKNESS. WEB.	NO. OF SECT'NS.
6 in.	4¼	⅝	1½	403	3 in.	6	½	⅝	420
6 in.	4	½	⅝	402	3 in.	5	7/16	9/16	158
6 in.	3	⅜@½	⅜@½	168	3 in.	4	7/16	9/16	160
5 in.	6	½	9/16	400	3 in.	3½	⅜	½	175
5 in.	5	½	9/16	137	3 in.	3¼	⅜ @½	⅜ @½	172
5 in.	5	¾	¾	404	3 in.	3	⅜	⅝	154,176
5 in.	4	7/16	9/16	139	3 in.	2½	⅜	⅝	162
5 in.	3½	⅜	⅝	138	3 in.	2	5/16	⅜ @½	159
5 in.	3	⅜	⅝	140	2¾ in.	4	½	½	411
5 in.	2¾	⅜	⅝	141	2½ in.	4	⅜ @½	⅜ @½	177
5 in.	2½	⅜	⅝	142	2½ in.	3½	⅜ @½	⅜ @½	174
4¾ in.	3½	⅝	1	406	2½ in.	3	5/16	½	163
4¾ in.	2¾	⅝	1	412	2½ in.	2½	5/16	⅜	166,178
4½ in.	4½	½@9/16	½	164	2½ in.	2	5/16	⅜	165
4½ in.	4	½	½	170	2¼ in.	2¼	5/16	⅜	155
4½ in.	3	⅜@9/16	⅜@⅝	407	2 in.	4	⅜ @½	⅜ @½	169
4½ in.	2¾	⅜	1	408	2 in.	3½	⅜	½	173
4½ in.	2½	⅜	⅝	150	2 in.	3	⅜	½	421
4½ in.	2¼	7/16	7/16	409	2 in.	2½	¼ @⅜	¼ @⅜	423
4½ in.	2	½	1	413	2 in.	2¼	¼	¼	422
4¼ in.	3	1	1	405	2 in.	2	⅜	½	167
4¼ in.	2	⅜	⅝	414	2 in.	1½	¼	5/16	147
4⅛ in.	4	⅜	½	171	2 in.	1	¼	¼	424
4 in.	5	½	⅝	143	1¾ in.	2¼	¼	¼	425
4 in.	4½	7/16	⅝	144	1¾ in.	1¾	¼ @⅜	¼ @⅜	426
4 in.	4	⅜	⅝	146	1¾ in.	1	¼	¼	427
4 in.	3	⅜	⅝	182	1⅝ in.	2½	5/16@⅜	5/16	428
4 in.	2½	⅜	⅝	149,151	1⅝ in.	1⅝	3/16@¼	3/16@¼	429
4 in.	2	⅜	⅝	153	1½ in.	2	¼	¼	430
4 in.	1⅞	⅜	⅝	410	1½ in.	1½	3/16@⅜	3/16@⅜	179
3⅞ in.	3	½	⅜	148	1½ in.	1	¼	¼	431
3½ in.	4	7/16	9/16	415	1⅜ in.	1⅜	¼ @⅜	¼ @⅜	432
3½ in.	3½	⅜	9/16	156	1¼ in.	1¼	3/16@¼	3/16@¼	180
3½ in.	3	⅜	½	157	1¼ in.	1	3/16	3/16	433
3½ in.	2½	⅜	⅜	416	1⅛ in.	1⅛	5/32@3/16	5/32@3/16	434
3½ in.	2	⅜	⅜	417	1 in.	1	⅛, 5/32, 3/16	⅛, 5/32, 3/16	435
3¼ in.	3½	⅜@½	⅜@½	418	⅞ in.	⅞	⅛, 5/32, 3/16	⅛, 5/32, 3/16	436
3¼ in.	3¼	⅜	½	181	¾ in.	1	⅛, 5/32, 3/16	⅛, 5/32, 3/16	438
3 in.	6½	½	⅝	419					

WROUGHT IRON BEAMS—Importation List.

HEIGHT.	FLANGE.	WEB.	NO. SECTIONS.	WEIGHT PER FOOT.
15 3/4	5 11/16	11/16	236 A	60 @ 97 lbs.
12	5 1/2	3/4	193	43 @ 57 lbs.
12	5 1/4	7/16	234	41 3/4 lbs.
10	5	3/4	194	30 @ 41 1/2 lbs.
9 7/8	4 5/8	7/16	235	29 1/2 lbs.
9 5/16	3 7/8	11/16	232	31 1/2 lbs.
9 5/16	3 3/4	7/16	233	22 lbs.
9 5/16	3 9/16	7/16	231	22 lbs.
9	5 × 3	1/2 to 5/8	253	28 @ 32 lbs.
8 3/4	2 3/4	5/8	214	17 @ 27 lbs.
8 3/4	2 1/2	3/8	210	16 2/3 @ 26 2/3 lbs.
8 11/16	2 9/16	5/16	183	17 @ 23 lbs.
8 5/8	3	7/16 to 3/4	255	20 @ 28 lbs.
8	5 5/8	7/8	228	37 1/2 lbs.
8	5 1/2	13/16	220	37 1/2 lbs.
8	5 3/16	7/16	227	29 1/2 lbs.
8	4 3/8	13/16	221	32 lbs.
8	4 3/8	13/16	230	32 lbs.
8	4	3/8	229	21 1/2 lbs.
8	3	5/8	244	29 lbs.
8	2 1/2	7/16	299	19 lbs.
8	2 7/16	3/8	209	14 @ 23 1/3 lbs.
7 15/16	3 3/8	3/8	187	14 @ 20 lbs.
7 13/16	2 1/2	5/8	213	23 lbs.
7 1/4	4	7/16	218	18 @ 24 lbs.
7 1/4	2 3/16	3/8	208	12 @ 20 lbs.
7 3/16	4	5/8	225	24 lbs.
7 3/16	3 11/16	3/8	224	18 lbs.
7 1/8	2 1/2	7/16	188	15 @ 18 lbs.
7	4	1/2	215	18 @ 24 lbs.
7	2 1/2	5/8	212	20 lbs.
7	2 3/8	7/16	301	17 lbs.
6 1/2	2 1/16	5/16	184	10 1/2 @ 16 lbs.
6 3/8	3 1/2	5/8	223	21 1/2 lbs.
6 3/8	3 3/16	5/16	222	15 1/2 lbs.
6 3/8	2 1/8	7/16	192	9 1/2 @ 16 1/2 lbs.
6 3/8	2	7/16	206	16 2/3 lbs.
6 3/8	1 3/4	3/8	207	9 1/3 lbs.
6 1/4	3 1/4	7/16	219	15 @ 18 lbs.

WROUGHT IRON BEAMS—Continued.



HEIGHT.	FLANGE.	WEB.	NO. SECTIONS.	WEIGHT PER FOOT.
6 1/4	3 3/16	3/8	195	14 @ 18 lbs.
6 1/4	1 3/4	7/16	254	12 1/2 @ 15 lbs.
6	6	1/2	243	30 lbs.
6	6	7/16	303	34 lbs.
6	5	1/2	248	28 lbs.
6	3	7/16 to 3/4	259	18 1/2 @ 22 lbs.
6	2 1/8	3/8	300	13 lbs.
6	2 1/8	5/16	240	13 @ 16 lbs.
6	2 × 1 1/4	5/16 to 1/2	257	12 @ 14 lbs.
5 13/16	2	3/8	241	9 1/2 @ 12 lbs.
5 5/8	3 1/8	7/16	226	15 1/2 lbs.
5 5/8	2 3/4	1/4	217	10 1/2 lbs.
5 5/8	2 3/16	1/2	252	16 1/2 lbs.
5 5/8	2 1/8	1/2	191	8 1/2 @ 13 1/2 lbs.
5 5/8	2	5/16	204	9 1/2 @ 12 lbs.
5 5/8	2	7/16	201	13 1/3 lbs.
5 5/8	1 15/16	5/16	251	12 1/4 lbs.
5 5/8	1 3/4	1/4	200	8 2/3 lbs.
5	5	1/2	247	33 lbs.
5	4 1/2	1/2	246	22 lbs.
5	1 3/4	5/16	302	9 lbs.
5	1 7/8	1/4	242	7 1/2 @ 10 lbs.
4 7/8	1 7/8	1/4	205	7 1/3 @ 10 lbs.
4 3/4	2	3/8	203	10 1/2 lbs.
4 3/4	1 3/4	7/16	211	10 2/3 lbs.
4 3/4	1 3/4	1/4	202	6 2/3 lbs.
4 5/8	3 3/8 × 2 3/4	1/2	250	17 lbs.
4 1/4	2 1/4	3/8 to 5/8	261	12 @ 15 lbs.
4	4 3/4	1/2	249	24 1/2 lbs.
4	4	1	245	31 lbs.
4	1 3/4	5/16	190	8 lbs.
4	1 3/4	5/16	199	8 lbs.
4	1 5/8	3/16	198	6 lbs.
3 1/2	1 1/2	5/16 to 5/8	258	7 @ 9 lbs.
3 1/4	1 3/4	5/16	189	6 lbs.
3 3/16	1 5/8	5/16	197	6 lbs.
3 3/16	1 9/16	1/8	196	4 1/3 lbs.
2 1/4	3/4	3/16 to 5/16	260	3 lbs.

WROUGHT IRON CHANNELS—Importation List.

WIDTH.		DEPTH.	THICKNESS.	NO. SECTIONS.	WEIGHT PER FOOT.
$9\frac{7}{8}$	×	$3\frac{1}{2}$	$\frac{7}{16}$ to $\frac{9}{16}$	444	27 @ 31 lbs.
$9\frac{1}{4}$	×	$3\frac{5}{8}$	$\frac{3}{8}$ to $\frac{5}{8}$	439	$21\frac{1}{2}$ @ $32\frac{1}{3}$ lbs.
$8\frac{1}{4}$	×	$2\frac{1}{4}$	$\frac{3}{8}$ to $\frac{1}{2}$	331	18 @ $20\frac{1}{4}$ lbs.
8	×	4	$\frac{5}{8}$	308	36 lbs.
8	×	$3\frac{1}{2}$	$\frac{1}{2}$ to $\frac{5}{8}$	330	$26\frac{1}{2}$ @ $29\frac{3}{4}$ lbs.
$7\frac{1}{2}$	×	3	$\frac{7}{16}$ to $\frac{9}{16}$	328	$22\frac{1}{2}$ lbs.
7	×	$2\frac{3}{8}$	$\frac{5}{16}$ to $\frac{5}{8}$	440	$12\frac{3}{4}$ @ $19\frac{1}{2}$ lbs.
7	×	$3\frac{1}{2}$	$\frac{1}{2}$	307	$23\frac{1}{2}$ lbs.
7	×	$2\frac{3}{4}$	$\frac{3}{8}$ to $\frac{1}{2}$	323	21 lbs.
6	×	$2\frac{1}{2}$	$\frac{3}{8}$ to $\frac{1}{2}$	321	$16\frac{1}{4}$ lbs.
6	×	$2\frac{1}{2}$	$\frac{5}{16}$ to $\frac{1}{2}$	441	$15\frac{2}{3}$ lbs.
$5\frac{1}{4}$	×	$1\frac{1}{2}$	$\frac{1}{4}$ to $\frac{3}{8}$	442	8 @ 10 lbs.
5	×	$2\frac{1}{4}$	$\frac{1}{2}$	336	$18\frac{1}{2}$ lbs.
$4\frac{3}{8}$	×	2	$\frac{3}{8}$ to $\frac{3}{4}$	329	13 lbs.
3	×	1	$\frac{7}{16}$	320	$6\frac{1}{4}$ lbs.
2	×	1	$\frac{5}{16}$	443	$2\frac{7}{8}$ lbs.
2	×	$\frac{11}{16}$	$\frac{1}{4}$	322	3 lbs.
$1\frac{5}{8}$	×	$\frac{5}{8}$	$\frac{1}{4}$	327	$1\frac{7}{8}$ lbs.
$1\frac{1}{4}$	×	$\frac{3}{8}$	$\frac{3}{16}$	326	$1\frac{1}{4}$ lbs.
$1\frac{1}{8}$	×	$\frac{3}{8}$	$\frac{3}{16}$	325	$\frac{87}{100}$ lbs.
$\frac{7}{8}$	×	$\frac{3}{8}$	$\frac{3}{16}$	324	$\frac{74}{100}$ lbs.

We have paid great attention to the compilation of the foregoing lists. They embrace the different forms manufactured by English, French and Belgian makers, and as they make this a special branch of trade, orders can be executed very promptly—say 90 days from receipt of specification.

To the contractor, architect, bridge and ship builder they are indispensable, as they show the forms, sizes and weight per foot of same. We will be pleased to furnish tracings of any pattern desired, and any orders we may be favored with will have the most careful attention.

WADSWORTH IRON WORKS.

WROUGHT IRON BEAMS.

NO.	DIMENSIONS.	PER LB.						
		20 ft. and under.	20 ft. to 25 ft.	25 ft. to 30 ft.	30 ft. to 35 ft.	35 ft. to 40 ft.	40 ft. to 45 ft.	45 ft. to 50 ft.
1	15 inch, 66⅔ lbs. per ft.	6¾ c.	7 c.	7¼ c.				
2	15 " 50 "	6¾	7	7¼	7½ c.			
3	12¼ " 60 "	6½	6½	6¾	7	7¼ c.		
4	12¼ " 41⅔ "	6½	6½	6¾	7	7¼	7½ c.	
5	10½ " 35 "	6¼	6¼	6¼	6½	6¾	7	7¼ c.
6	9 " 30 "	6¼	6¼	6¼	6½	6¾	7	7¼
7	9 " 23⅓ "	6¼	6¼	6¼	6½	6¾	7	7¼
8	8 " 21⅔ "	6¼	6¼	6¼	6½	6¾	7	7¼
9	7 " 20 "	6¼	6¼	6¼	6½	6¾	7	7¼
10	6 " 16⅔ "	6¼	6¼	6¼	6½	6¾	7	7¼
11	6 " 13⅓ "	6¼	6¼	6¼	6½	6¾	7	7¼

WROUGHT IRON CHANNELS.

DIMENSIONS.	PER LB.						
	20 ft. and under.	20 ft. to 25 ft.	25 ft. to 30 ft.	30 ft. to 35 ft.	35 ft. to 40 ft.	40 ft. to 45 ft.	45 ft. to 50 ft.
12 × 3 × ½, 33⅓ lbs. per foot.	6½ c.	6½ c.	6¾ c.	7 c.	7¼ c.	7½ c.	7¾ c.
9 × 2½ × 5/16, 16⅔ "	6¼	6¼	6¼	6½	6¾	7	7¼
6 × 2 × ¼, 10 "	6¼	6¼	6¼	6½	6¾	7	7¼

Strength of Wadsworth Iron Works Beams.

The following table shows the safe load in tons of 2,000 lb., equally distributed, which the different beams will support. These figures have been obtained by actual experience, and therefore can be depended upon by engineers and architects.

NO.	HEIGHT OF BEAM.	WEIGHT PER FOOT.	AREA OF SECTION.	SAFE LOAD UNIFORMLY DISTRIBUTED BETWEEN SUPPORTS.		
				10 Feet.	20 Feet.	30 Feet.
1	15	66⅔	19.77	76.3	38.2	25.4
2	15	50	14.83	52.3	26.1	17.4
3	12¼	60	17.79	57.4	28.7	19.1
4	12¼	41⅔	12.46	37.3	18.6	12.4
5	10½	35	10.37	27.7	13.8	9.2
6	9	30	8.90	20.2	10.1	6.7
7	9	23⅓	6.92	15.1	7.5	5.
8	8	21⅔	6.43	13.3	6.6	4.4
9	7	20	5.93	10.4	5.2	3.4
10	6	16⅔	4.94	7.7	3.8	2.5
11	6	13⅓	3.95	6.4	3.2	2.1

The above table is for buildings and structures where the weight is permanent.

SWEDISH AND NORWAY IRON.

ORDERS SOLICITED FOR IMPORTATION.

We respectfully call the attention of machinists and manufacturers to the following list of Swedish and Norway Iron. We have in stock a full assortment of Flats, Squares, Rounds, Shapes, and Nail Rods. Orders will be promptly executed.

Our arrangements for importing are complete; Iron, thus ordered, will be delivered at dock in Boston, New York, or at purchaser's depot, as may be agreed upon. We are also prepared to take orders for Iron rolled to shape, and ship the same direct from the mill—thus saving many incidental expenses. By this method we will be enabled to make a price quite as low as Eastern importers.

ORDINARY SIZES.

$1\frac{1}{2} \times \frac{5}{8}$, and thicker,	per ℔.
$1\frac{5}{8} \times \frac{1}{2}$, do.	do.
$1\frac{3}{4}$ to 5 $\times \frac{7}{16}$, do.	do.
$\frac{7}{8}$ to 2 in. square,	do.
$1\frac{1}{8}$ to 2 in. round,	do.

EXTRA SIZES.

All widths of $\frac{3}{8}$ in. thick, not less than $1\frac{3}{4}$ in. wide, or more than 5 in. wide,	$\frac{1}{4}$ cent per ℔ extra.
Flat, bars exceeding 5 in. wide, for every inch,	$\frac{1}{4}$ do.
Flat, bars exceeding 6 in. wide, subject to the additional import duty.	

Extra sizes, flats. See memorandum marked "Rolled Iron," known as "Shapes."

SQUARE.

For every $\frac{1}{4}$ in. greater than 2 in. square, $\frac{1}{4}$ cent extra and the additional import duty.

ROUNDS.

Greater than 2 in. not made.

$\frac{7}{8}$ to 1 in. round,		$\frac{1}{2}$ cent per ℔ extra.
$1\frac{3}{16}$ do.	1	do.
$\frac{3}{4}$ do.		
$\frac{5}{8}$ do.	2	do.
$\frac{1}{2}$ do.	2	do.
$\frac{3}{8}$ do.	$2\frac{1}{2}$	do.
$\frac{5}{16}$ do.	$2\frac{3}{4}$	do.
$\frac{1}{4}$ do.	$2\frac{3}{4}$	do.
No. 4 do.	3	do.
$\frac{3}{16}$ do.	$3\frac{1}{2}$	do.

SWEDISH AND NORWAY IRON.

SQUARES.

1 3/16 in. square,	1	cent per ℔ extra.
3/4 do.	1	do.
5/8 do.	2	do.
1/2 do.	2	do.
3/8 do.	2 1/2	do.
5/16 do.	2 3/4	do.
1/4 do.	2 3/4	do.

ROLLED IRON.

SHAPES, Rerolled from Imported Bars.

5/8 × 3/8 to 1/2 3/4 × 3/8 to 5/8 7/8 to 1 1/8 × 5/16 to 3/4 1 1/4 × 1/4 to 3/4 1 3/8 to 3 × 1/8 to 3/4 3/8 to 3/4, square	1 1/4	cents per ℔ extra.

SHAPES, Rolled in Grooved Rolls to Exact Size—Square Edge.

1/2 and 5/8 × 1/8 3/4 to 1 × 1/8 1/2 to 1 × 1/4	2 1/2	cents per ℔ extra.
1/2 to 1 × 5/16,	2 1/4	do.
1/2 to 1 × 3/8,	2	do.

NAIL RODS, Slit.

1/4 × 3/16 5/16 × 3/16 3/8 × 3/16	1 1/4	cents per ℔ extra.

NAIL RODS, Rolled.

3/8 × 3/16 13/32 × 3/16 7/16 × 3/16 15/32 × 3/16	per ℔.

RAILROAD IRON.

We are in constant receipt of quotations for Rails from the principal manufacturers of England, Wales and Belgium, and any orders our friends may hand us will have the best attention.

All quotations for foreign rails are in gold, net cash, delivered at the side of the vessel at port of entry.

Iron Rails, to any pattern not less than 50 tons, - per ton.
Steel do. do. do. - - do.

RAILROAD IRON CHAIRS.

Cast Iron, - - - - - - per ℔.
Wrought Iron, - - - - do.

RAILROAD SPIKES.

$5\frac{1}{2} \times \frac{9}{16}$, - - - - See Nails.
$5\frac{1}{2} \times \frac{1}{2}$, - - - - do.

FISH PLATES.

Punched and ready for use, - - - - per ℔.

FISH PLATE BOLTS.

With head and nut, *forged thread*,* - See Bolts.
With two nuts, do. - - do.

BRIDGE BOLTS.

Made to any size or pattern, *forged thread*, See Bolts.

BOLT ENDS.

Made to any size, *forged thread*, - See Bolts.

TURNBUCKLES.

Made to any size, *forged thread*, - See Bolts.

* This thread, being forged in the iron, is much stronger and has a finer finish than the old cut thread; the hard, smooth surface protects it from rust, and the fibre being unbroken (as in the old bolt), insures it from stripping. We have every confidence in its durability and strength, and a trial will satisfy the most skeptical of its utility.

SCOTCH PIG IRON.

No. 1, Gartsherrie,	per ton.
No. 1, Coltness,	do.
No. 1, Summerlee,	do.
No. 1, Glengarnock,	do.
No. 1, Langloan,	do.
No. 1, Eglinton,	do.
No. 1, Carnbroe,	do.
No. 1, Govan,	do.
No. 1, Clyde,	do.

CHARCOAL PIG IRON.

No. 1, Lake Superior Morgan,	per ton.
No. 1, " " Michigan,	do.
No. 1, " " Champion,	do.
No. 1, " " Greenwood,	do.
No. 2, " " Morgan, Michigan and Champion,	do.
No. 3, " " " " "	do.
No. 4 and 5, " " " "	do.
No. 1 and 2, Cold Blast Woodville, for Car Wheels,	do.
No. 3, White do. " "	do.
No. 1, Salisbury,	do.
No. 2, Salisbury, for Car Wheels,	do.
No. 3, " "	do.
No. 4 and 4½, " "	do.
No. 5 and 6, " "	do.

ANTHRACITE AND BITUMINOUS COAL PIG IRON.

No. 1, Chicago, from Lake Superior Ore,	per ton.
No. 2, " " "	do.
No. 1. Franklin,	do.

FINISHED SHAFTING.

Polished Iron Shafting, Piston Rods, Etc.

DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.	DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.
4 inch.	10 cents.	41.88	1 3/8 inch.	12 cents.	4.95
3 3/4 do.		36.80	1 5/16 do.		4.51
3 1/2 do.		32.06	1 1/4 do.		4.08
3 1/4 do.		27.65	1 3/16 do.		3.69
3 do.		23.56	1 1/8 do.	12 1/2	3.31
2 7/8 do.		21.63	1 1/16 do.		2.95
2 3/4 do.		19.79	1 do.		2.61
2 5/8 do.		18.04	15/16 do.	15	2.29
2 1/2 do.	10 1/2	16.36	7/8 do.		2.00
2 3/8 do.		14.76	13/16 do.		1.72
2 1/4 do.		13.24	3/4 do.		1.47
2 3/16 do.		12.61	11/16 do.	16	1.23
2 1/8 do.		11.82	5/8 do.		1.02
2 do.		10.47	9/16 do.		.828
1 15/16 do.	11	9.83	1/2 do.	19	.654
1 7/8 do.		9.20	7/16 do.		.501
1 3/4 do.		8.01	3/8 do.		.368
1 5/8 do.	11 1/2	6.91	5/16 do.		.255
1 1/2 do.		5.89			
1 7/16 do.		5.40			

Polished Steel Surfaced Shafting, Piston Rods, Etc.

DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.	DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.
4 inch.	12 cents.	42.29	1 3/8 inch.	14 cents.	4.99
3 3/4 do.		37.16	1 5/16 do.		4.55
3 1/2 do.		32.38	1 1/4 do.		4.12
3 1/4 do.		27.92	1 3/16 do.		3.72
3 do.		23.79	1 1/8 do.	14 1/2	3.34
2 7/8 do.		21.84	1 1/16 do.		2.98
2 3/4 do.		19.98	1 do.		2.63
2 5/8 do.		18.22	15/16 do.	17	2.31
2 1/2 do.	12 1/2	16.52	7/8 do.		2.02
2 3/8 do.		14.90	13/16 do.		1.73
2 1/4 do.		13.37	3/4 do.		1.48
2 3/16 do.		12.73	11/16 do.	18	1.24
2 1/8 do.		11.93	5/8 do.		1.03
2 do.		10.57	9/16 do.		.836
1 15/16 do.	13	9.92	1/2 do.	21	.660
1 7/8 do.		9.29	7/16 do.		.507
1 3/4 do.		8.09	3/8 do.		.371
1 5/8 do.	13 1/2	6.97	5/16 do.		.257
1 1/2 do.		5.94			
1 7/16 do.		5.45			

FINISHED SHAFTING.

Polished Cast Steel Shafting, Spindles and Piston Rods.

DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.	DIAMETER.	PRICE PER LB.	WEIGHT PER FOOT.
1½ inch.	19 cents.	6.00	⅞ inch.	23 cents.	2.04
1 7/16 do.		5.50	1 3/16 do.		1.75
1⅜ do.	20	5.04	¾ do.		1.50
1 5/16 do.		4.60	1 1/16 do.	25	1.25
1¼ do.		4.16	5/8 do.		1.04
1 3/16 do.	21	3.96	9/16 do.	28	.844
1⅛ do.		3.37	½ do.	30	.667
1 1/16 do.		3.01	7/16 do.	32	.510
1 do.	22	2.66	⅜ do.	35	.375
15/16 do.		2.34	5/16 do.	40	.260

Taper Spindles or Shafting made to order.

Polished Wrought Iron Welded Tubes for Railings.

INSIDE DIAMETER, INCHES.	PRICE PER FOOT.	INSIDE DIAMETER, INCHES.	PRICE PER FOOT.
⅛	28 cents.	¾	44 cents.
¼	31 do.	1	53 do.
⅜	35 do.	1¼	63 do.
½	39 do.	1½	75 do.

WROUGHT IRON FORGINGS.

Car Axles	per lb.
Driving Axles	do.
Truck do.	do.
Connecting Rods	do.
Cranks	do.
Crank Pins	do.
Piston Rods	do.
Steamboat Shafting	do.
Mill Shafting	do.

Blacksmith Work of all descriptions.

We have every facility for executing orders for this class of work, and guarantee quality and workmanship.

WROUGHT IRON.

List of Odd Forms of Wrought Iron manufactured in the United States and Europe.

Angle,	Equal sides, unequal, acute, obtuse, round back, double, and bulb.	
Beam,	Various sections,	For buildings and bridges.
Bulb,	do.	For deck beams and bridges.
Beveled,	do.	For millwrights and ship builders.
Boat Guard,	do.	For ship builders.
Burr,	do.	For railroad work.
Channel,	do.	For buildings and bridges.
Chair,	do.	For rails.
Chequered,		For engine rooms and locomotives.
Door Molding,		For safes and engineer's work.
Engineer's Fancy,	do.	For engineering.
Furnace Bar,	do.	For boilers and furnaces.
Fish Plate,	do.	For rails punched ready for use.
Glut,	do.	For railroad work.
Grooved,	do.	For sliding doors.
Hand Rail,	do.	For staircases and balconies.
Hexagon,	do.	For engines.
Half Octagon,	do.	For engines and tires.
Half Moon,		do. do.
Joist and Girder,	do.	For fire-proof buildings, locomotives, and bridges.
Nave,		For wheels.
Nut,		For railroad bolts.
Rabbet,		For iron doors and gates.
Rail,	do.	Double headed, flange, bridge guard, tramway and contractors.
Stay Bolt,		For boilers.
Spoke,		For locomotives.
Sash,	do.	For windows.
Ship Knee,		For ships and barges.
Tire,	Special shapes,	For carriages and locomotives.
Tee,	Various sections,	For engineer and boiler work.
Triangular,	do.	For engineers.
Trough,	do.	For elevators and agric'l implements.
Wedge.	do.	For agricultural and engineer's work.

STEEL.

ENGLISH STEEL.

Importation List.

Extra Cast Steel,	per lb.
Best " "	do.
Second quality Cast Steel,	do.
Third " " "	do.
Fourth " " "	do.
Machinery Round Steel,	do.
Swaged Cast Steel,	do.
Shear Best Double Steel,	do.
Shear Best Single "	do.
Blister First quality Swedish Steel,	do.
Blister Second " "	do.
Blister Third " "	do.
German Best " "	do.
German Second " "	do.
German Third " "	do.
Sheet Best " "	do.
Sheet Second " "	do.
Sheet Third " "	do.
Shovel Best " "	do.
Shovel Common " "	do.
Hoe Sheet "	do.
Mill Saw "	do.
Billet Web "	do.
Cross Cut Saw "	do.
Circular Saw "	do.
Toe Calk Best quality "	do.
Toe Calk Common " "	do.
Spring Best quality Swedish "	do.
Spring Second " "	do.
Spring Third " "	do.
Spring Cast "	do.
Tire Steel,	do.
Sleigh Shoe Steel,	do.

ENGLISH STEEL—Continued.

German Plow Steel,*	per ℔.
Cast " "	do.
Bessemer Cast Steel,	do.
Cultivator Blades, cut to pattern,	do.
Circular Plow Colters, "	do.
Plow Mould Boards, "	do.
Plow Plates, "	do.
Fork Steel,	do.
Rake "	do.
Roller and Spindle Steel,	do.
Cutter and Finger bar Steel,	do.
Slide bar "	do.
Scraper "	do.
Wire Rod, "	do.
Soft Centre Steel, for taps,	do.
Skate Steel,	do.
Cutlery "	do.
File "	do.
Rasp "	do.
Rail Frogs, made to pattern,	do.
Railway Car Springs,	do.
Railway Car Axles,	do.

JENKS' PLOW STEEL.

* This Steel is converted from Swedish Iron, and every precaution is taken to insure uniform temper and tensile strength. We have sold Jenks' Steel for the past fifteen years, and our experience has taught us the wants of this market. Mr. Jenks has carefully noted our instructions as regards temper required for our soil, and special instructions will, at all times, have his best attention.

Messrs. Deere & Co., of Moline, and Skinner, Briggs, Enoch & Co., of Rockford, are the largest consumers of this Steel in the West, and we take pleasure in referring to them.

Being sole agents in the Northwest for Jenks' Celebrated Steel, we are prepared to receive orders for importation. Prompt shipments and quality guaranteed. Owing to fluctuations on gold premium, we cannot make a fixed price. Quotations furnished on application.

It will require about ninety days from receipt of order to execute same.

ENGLISH CAST STEEL—Common Sizes.

SQUARE.

$\frac{3}{8}$ to 2 inch, - - - - - - - - per lb.

OCTAGON.

$\frac{3}{8}$ to 2 inch, - - - - - - - - per lb.

ROUND.

$\frac{3}{8}$ to 2 inch, - - - - - - - - per lb.

FLAT.

$\frac{1}{2} \times \frac{5}{16}$ and over,	per lb.
$\frac{5}{8} \times \frac{1}{4}$ and over,	do.
$\frac{3}{4}$ to 1 $\times \frac{3}{16}$ and over,	do.
$1\frac{1}{8}$ to 2 inclusive $\times \frac{1}{8}$ and over,	do.
$2\frac{1}{4} \times \frac{1}{8}$ to $1\frac{3}{4}$ in.,	do.
$2\frac{1}{2} \times \frac{1}{8}$ to $1\frac{1}{2}$,	do.
$2\frac{3}{4} \times \frac{1}{8}$ to $1\frac{3}{8}$,	do.
$3 \times \frac{1}{8}$ to $1\frac{1}{4}$,	do.
$3\frac{1}{2} \times \frac{1}{8}$ to $1\frac{1}{8}$,	do.
$4 \times \frac{1}{8}$ to 1,	do.
$4\frac{1}{2} \times \frac{1}{8}$ to $\frac{7}{8}$,	do.
$5 \times \frac{1}{8}$ to $\frac{3}{4}$,	do.
$6 \times \frac{1}{8}$ to $\frac{5}{8}$,	do.

Sheets up to 21 gauge.

ENGLISH CAST STEEL—Extra Sizes.

SQUARE.

$\frac{1}{8}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{7}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$2\frac{1}{8}$ to 3	$3\frac{1}{8}$ to 4	$4\frac{1}{2}$ in.	
19c.	11	6	3	2	1	1	2	3	extra per lb.

ROUND.

$\frac{1}{8}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{7}{32}$	$\frac{1}{4}$	$\frac{5}{16}$	$2\frac{1}{8}$ to 3	$3\frac{1}{8}$ to $3\frac{1}{2}$	$3\frac{5}{8}$ to 4 in.	
14c.	11	7	3	2	1	$\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	extra per lb.

OCTAGON.

$\frac{5}{16}$	
2c.	extra per lb.

ENGLISH CAST STEEL—Extra Sizes.

FLAT.

$\frac{1}{4} \times \frac{1}{8}$	$\frac{3}{8} \times \frac{1}{8}$	$\frac{3}{8} \times \frac{1}{4}$	$\frac{1}{2} \times \frac{1}{8}$	$\frac{1}{2} \times \frac{3}{16}$ in.	
11c.	4	1	2	1	extra per lb.
$\frac{1}{2} \times \frac{1}{4}$	$\frac{5}{8} \times \frac{1}{8}$	$\frac{5}{8} \times \frac{3}{16}$	$\frac{3}{4}$, $\frac{7}{8}$ and 1 $\times \frac{1}{8}$ in.		
1c.	2	1	1		extra per lb.
$2\frac{1}{2} \times 1\frac{5}{8}$ and over,		$2\frac{3}{4} \times 1\frac{1}{2}$ and over,		$3 \times 1\frac{3}{8}$ and over,	
1c.		1		1	extra per lb.
$3\frac{1}{2} \times 1\frac{1}{4}$ to $2\frac{1}{2}$		$4 \times 1\frac{1}{8}$ to $2\frac{1}{4}$		$4 \times 2\frac{1}{2}$ to $3\frac{3}{4}$ in.	
1c.		1		2	extra per lb.
$4\frac{1}{2} \times 1$ to 2		$4\frac{1}{2} \times 2\frac{1}{4}$ to $3\frac{1}{2}$		$5 \times \frac{7}{8}$ to $1\frac{3}{4}$ in.	
1c.		2		1	extra per lb.
5×2 to 3		$6 \times \frac{3}{4}$ to $1\frac{1}{2}$		$6 \times 1\frac{3}{4}$ to $2\frac{1}{2}$ in.,	
2c.		1		2	extra per lb.

Sheet Steel, thinner than No. 21, for each gauge, 1 cent extra.

AMERICAN STEEL.

Flat, Square, Octagon, - - - - - -	per lb.
Hammer, - - - - - - -	do.
Round Machinery, - - - - - -	do.

AMERICAN STEEL—Common Sizes.

SQUARE AND OCTAGON.

$\frac{1}{2}$ to 2 in. - - - - - - -	per lb.

FLAT.

1 to 4 $\times \frac{7}{16}$ and thicker, - - - -	per lb.

ROUND.

$\frac{5}{8}$ to 2 in. - - - - - - -	per lb.

AMERICAN STEEL—Extra Sizes.

SQUARE AND OCTAGON.

$\frac{3}{8}$ and $2\frac{1}{8}$ to 3 in.	$\frac{5}{16}$ and $3\frac{1}{8}$ to 4 in.	$\frac{1}{4}$	
1c.	2	3	extra per lb.

FLAT.

$\frac{3}{8}$ thick, any width,	$\frac{5}{16}$, $\frac{1}{4}$, $\frac{3}{16}$ thick, any width,	
1c.	2	extra per lb.

ROUND.

$\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$ and $2\frac{1}{8}$ to 3 in.	$\frac{5}{16}$ and $3\frac{1}{8}$ to 4,	$\frac{1}{4}$	
1c.	2	4	extra per lb.

JENKS' SPRING STEEL.

1¼ to 6 × 3/16 to ½,		per ℔.
1⅛ to 1 × 3/16 and ¼,	½ cent extra	do.
1 × ⅛,	1 do.	do.
⅞ and ¾ × ⅛, 3/16 and ¼,	1½ do.	do.

JENKS' STEEL TIRE.

1¼ to 1 × 3/16, ¼ and 5/16, square edge,		per ℔.
1 × ⅛, do.	1 cent extra	do.
⅞ and ¾ × ⅛, 3/16 and ¼,	1½ do.	do.

BESSEMER STEEL TIRE.

1¼ to 1 × 3/16, ¼ and 5/16, square edge,		per ℔.
1 × ⅛, do.	1 cent extra	do.
⅞ and ¾ × ⅛, 3/16 and ¼, do.	1½ do.	do.

CAST STEEL TIRE.

1¼ to 1 × 3/16, ¼ and 5/16, square edge,		per ℔.
1 × ⅛, do.	1 cent extra	do.
⅞ and ¾ × ⅛, 3/16 and ¼, do.	1½ do.	do.

STEEL MIXED TIRE.

1¼ to 1 × 3/16, ¼ and 5/16, square edge,		per ℔.
1 × ⅛, do.	1 cent extra	do.
⅞ and ¾, ⅛, 3/16 and ¼, do.	1½ do.	do.

SLEIGH SHOE STEEL.

1½ to ⅞ in. wide, any thickness,		per ℔.
¾ to ⅜,	½ cent extra	do.

TOE CALK STEEL.

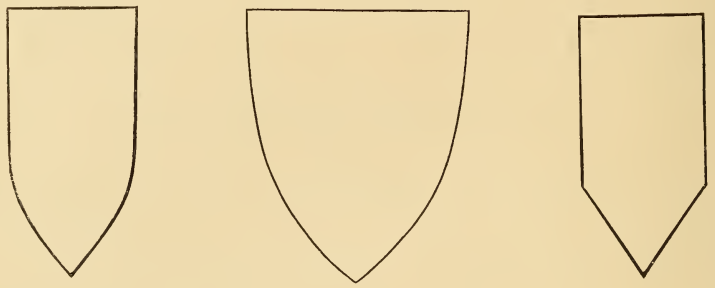
⅜ square and larger, ½ × 1/16 to ⅞ × ½,	per ℔.

CIRCULAR SAW.

48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80 in. per ℔.

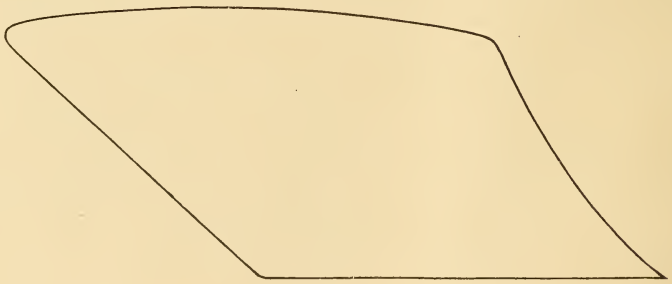
PLOW STEEL.

German, "Jenks,"	3 to 16 × $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$,	per ℔.
Cast,	3 to 16 × $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$,	do.
Bessemer Cast Steel,	3 to 16 × $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$,	do.



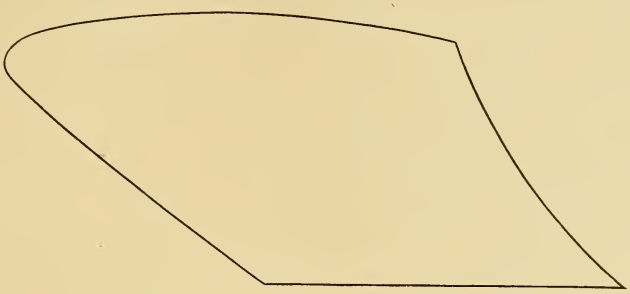
CULTIVATOR SHOVELS.

Cast Steel,	per ℔.
German do. "Jenks,"	do.
Bessemer do.	do.



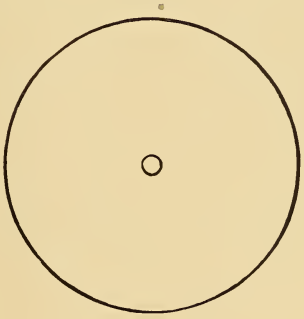
MOULD BOARDS.

Cast Steel,	per ℔.
German do. "Jenks,"	do.
Bessemer do.	do.



MOULD BOARDS.

Cast Steel,	per lb.
German do. "Jenks,"	do.
Bessemer do.	do.



PLOW COLTER PLATES.

Cast Steel,	per lb.
German do. "Jenks,"	do.
Bessemer do.	do.

PLOW PATCHES.

Cast Steel, to any pattern,	per lb.
German do. "Jenks," do.	do.
Bessemer do.	do.

TAPERED STEEL CUTTER & SLEIGH SHOES.

2 × ¾,			Common sizes.
1¾ × ⅝,	½ cent extra above		do.
1½ × ⅝,	1	do.	do.
1⅜ × 9/16,	1½	do.	do.
1¼ × ½,	2	do.	do.
1⅛ × ½,	2½	do.	do.
1 × ⅜, 7/16 and ½,	3	do.	do.
⅞ × ⅜, 7/16 and ½,	3½	do.	do.
¾ × 5/16, ⅜ and 7/16,	4	do.	do.
⅝ × 5/16, ⅜,	4½	do.	do.

BESSEMER ROLLED FINISHED STEEL.

ROUNDS AND SQUARES.

1 in. to 2¾ inch,			Common sizes.
3 in. to 3½ inch,	½ cent extra above		common sizes.
3¾ to 4 inch,	1½	do.	do.
4¼ to 4½ inch,	2	do.	do.
⅞ and ¾ inch,	¼	do.	do.
⅝ and 9/16 inch,	½	do.	do.
⅜, 7/16 and ½ inch,	1½	do.	do.
5/16 inch,	3½	do.	do.
¼ inch,	4	do.	do.
3/16 inch,	7	do.	do.

FLATS.

1½ to 4 × ⅜ to 1 inch,			Common sizes.
4¼ to 6 × ⅜ to 1 inch,	¼ cent extra above		common sizes.
2 to 4 × 1⅛ to 1½ inch,	¼	do.	do.
4¼ to 6 × 1⅛ to 1½ inch,	½	do.	do.
⅝ to 1⅜ × 5/16 to ⅞ inch,	1½	do.	do.

HEAVY BAND.

2 to 4 × 3/16 to 5/16 inch,	¾ cent extra above		common sizes.
4⅛ to 6 × 3/16 to 5/16 inch,	1	do.	do.
1½ to 1⅞ × 3/16 to 5/16 inch,	1½	do.	do.
⅞ to 1⅜ × 3/16 to 5/16 inch,	3	do.	do.
½ to ¾ × 3/16 to 5/16 inch,	5	do.	do.

BESSEMER ROLLED FINISHED STEEL—Con'd.

HOOP AND LIGHT BAND.

2¼ to 3 inch,	1¼ cent extra above common sizes.		
3⅛ to 4¾ inch,	1½	do.	do.
5 to 6 inch,	2	do.	do.
1¾ to 2 inch,	1¾	do.	do.
1½ inch	2½	do.	do.
1⅛ and 1¼ inch up to No. 20.	4	do.	do.
1 inch up to No. 20,	5	do.	do.
⅞ inch up to No. 21,	6	do.	do.
¾ inch up to No. 22,	7	do.	do.

OVAL.

⅞ to 1¼ inch,	½ cent extra above common sizes.		
⅝ to ¾ inch,	1	do.	do.
½ inch,	1½	do.	do.
⅜ inch,	2	do.	do.

HALF OVAL AND HALF ROUND.

1½ to 3 inch,	Same prices as common sizes.		
⅞ to 1¼ inch,	1	cent extra above	do.
⅝ to ¾ inch,	2	do.	do.
½ inch,	3	do.	do.
⅜ inch,	4	do.	do.

RAILROAD FORGINGS.

Car, Tender and Engine Axles, plain,	per ℔.
Locomotive Piston Rods, plain,	do.
do. do. with collars,	do.
do. Crank Pins,	do.
do. Connecting Rods, usual style,	do.
Frog Points and Plates,	do.
Frog Side Bars,	do.
Plain Forgings, 500 to 1,000 ℔s	do.

MARINE FORGINGS.

Marine Engine Cranks, forged,	per ℔.
do. Shafts,	do.
do. Connecting Rods,	do.
do. Cross Heads,	do.
do. Piston Rods,	do.
do. Beam Straps,	do.
do. Crank Pins,	do.

STEEL WITH IRON CENTRE.

The Steel with Iron Centre, which we now offer the trade, is made by a peculiar process. It may be tempered as hard as Cast Steel on the outside, while the centre remains as fibrous as the toughest Wrought Iron, thus securing a peculiar combination not otherwise obtained. It is rigid, elastic, and sustains a high polish, and is especially adapted for Shafting, Spindles, Piston Rods and Slides, Axles, and for all purposes where a hard surface, great strength and a high polish is required.

FLAT BAR.

1½ to 4 × ⅜ to 1 inch, -		Common sizes.
4¼ to 6 × ⅜ to 1 inch, - -	¼ cent extra above	do.
2 to 4 × 1⅛ to 1½ inch, -	½ do.	do.
4¼ to 6 × 1⅛ to 1½ inch, - -	1 do.	do.
DANDY TIRE—1⅛ to 1⅜ × ⅜ to ¾ in.	½ cent less than	do.

ROUND AND SQUARE.

1 to 2½ inch, - - -		Common sizes.
¾ and ⅞ inch, - -	½ cent extra above	do.
⅝ and 9/16 inch, - - -	¾ do.	do.
½, ⅜ and 7/16 inch, - -	1 do.	do.
5/16 inch, - - - -	1½ do.	do.
¼ inch, - - -	2 do.	do.
3/16 inch, - - -	3½ do.	do.

OVAL.

⅞ to 1¼ inch, - - -	1 cent extra above	common sizes.
⅝ and ¾ inch, - - -	1½ do.	do.
½ inch, - - -	2 do.	do.
⅜ inch, - - -	2½ do.	do.

HALF OVAL AND HALF ROUND.

1½ to 2 inch, - - -	½ cent extra above	common sizes.
⅞ to 1¼ inch, - - -	1½ do.	do.
⅝ to ¾ inch, - - -	2 do.	do.
½ inch, - - -	2½ do.	do.
⅜ inch, - -	3½ do.	do.

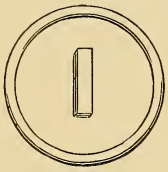
BORAX.

Best refined, - - - - - - - per lb.

BABBITT METAL.

The reputation of our Babbitt Metal is second to none manufactured in the country, and being made exclusively of new metals, the ingots (weighing 2½ lbs. each) are very handsome in appearance.

For ordinary machinery, - - - - per lb.



For car boxes, etc., - - - 10 cents extra per lb.

Very superior, for circular saws, etc., - - 20 cents extra per lb.

The highest possible grade, - - - 30 cents extra per lb.

NAILS.

Extras hereafter named are to be added to price of ordinary sizes, viz.: 10 to 60.

NAILS, FENCE AND BRADS.

10d. to 60d.			per keg.
8d. to 9d.	25 cents extra		do.
6d. to 7d.	50	do.	do.
4d. to 5d.	75	do.	do.
3d.	1.50	do.	do.
2d.	2.75	do.	do.

FINE.

3d.	$2.75 extra	per keg.
2d.	3.75	do.

CLINCH.

6d. to 10d.	$2.75 extra per keg.

CASING.

10d. to 16d.	75 cents extra	per keg.	
8d.	1.00	do.	do.
6d.	1.25	do.	do.

FINISHING.

10d. to 16d.	$1.25 extra	per keg.
8d.	1.50	do.
6d.	1.75	do.

BARREL.

1½ inch,	75 cents extra	per keg.	
1¼ "	1.50	do.	do.
1⅛ "	1.75	do.	do.
1 "	2.50	do.	do.
⅞ "	3.00	do.	do.

LINING NAILS.

⅞,	$4.50 extra per keg.

NAILS—Continued.

CUT SPIKES.

3 to 6 inches long, - - - 25 cents extra per keg.

WROUGHT SPIKES.

$\frac{1}{2}$ and $\frac{9}{16}$ square, any length,
$\frac{7}{16}$ - - - } - - per keg.
$\frac{3}{8}$ - - -

$\frac{5}{16}$ - - - - - - 25 cents extra do.
$\frac{1}{4}$ - - - - - - 50 do. do.

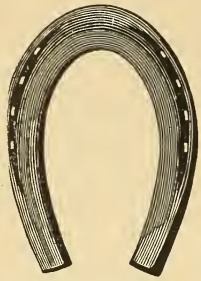
LENGTH OF NAILS.

2	3	4	5	6	7	8	9	10	12	16	20	30	40	50	60d.
1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6in.

RAILROAD SPIKES.

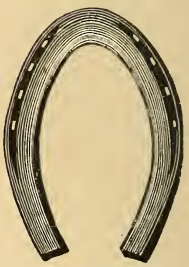
$5\frac{1}{2} \times \frac{9}{16}$ — 1.6 per lb. - - - - - per lb.
$5\frac{1}{2} \times \frac{1}{2}$ — 2 do. - - - - do.

HORSE SHOES.



Forward.

BURDEN'S PATENT.



Hind.

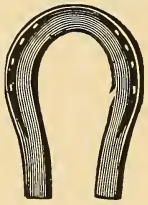
Forward, Nos. 1, 2, 3, 4, 5, 6, - - - - per keg.
Hind, Nos. 1, 2, 3, 4, 5, 6, - - - - do.
Only one number in each keg.

ASSORTED HORSE SHOES.

Forward and Hind, Only one number in each keg. - per keg.
do. Nos. 1, 2, 3, in each keg, - - do.
do. Nos. 2, 3, do. - do.
do. Nos. 2, 3, 4, do. - - do.
do. Nos. 3, 4, 5, do. - do.

We would suggest to our friends the advantage to be derived from ordering Shoes packed single numbers in a keg.

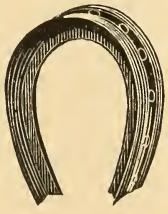
MULE SHOES.



Nos. 1, 2, 3, 4, - - - - - per keg.
Only one number in each keg.

ASSORTED MULE SHOES.

Mule Shoes will be packed single numbers in a keg, or assorted, as may be desired.



Continuous Steel Calk, - - - - per keg.

HORSE NAILS.

THE WESTERN—Patent Hammered.

No. 10,			per lb.
9,	1 cent extra		do.
8,	2	do.	do.
7,	3	do.	do.
6,	5	do.	do.
5,	8	do.	do.

COUNTERSUNK—Patent Hammered.

No. 10,			per lb.
9,	1 cent extra		do.
8,	2	do.	do.
7,	3	do.	do.
6,	5	do.	do.
5,	8	do.	do.

NORTHWESTERN.

No. 10,			per lb.
9,	1 cent extra		do.
8,	2	do.	do.
7,	3	do.	do.
6,	5	do.	do.
5,	8	do.	do.

LENGTH OF HORSE NAILS.

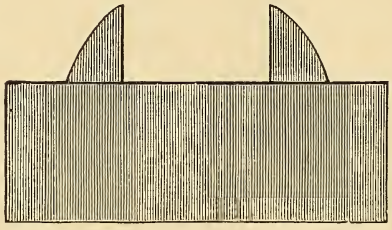
No. 10,	9,	8,	7,	6,	5,
$2\frac{5}{8}$	$2\frac{3}{8}$	$2\frac{1}{4}$	$2\frac{1}{8}$	2	$1\frac{7}{8}$ inches.

HORSE SHOE CUSHIONS.

Nos. 1, 2, 3,	- - - - -	per dozen pairs.
4 and 5,	- - - - -	do. do.
6 and 7,	- - - - -	do. do.

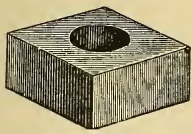
In ordering, specify the size Horse Shoe the Cushion is intended for.

TOE CALKS.



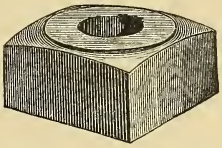
STEEL, 25 LB. PER BOX.

	SIZE.	WEIGHT.	
No. 1,	$1\frac{3}{8} \times \frac{7}{16} \times \frac{5}{16}$,	17 to the lb.	per lb.
2,	$1\frac{5}{8} \times \frac{9}{16} \times \frac{3}{8}$,	10 do.	do.
3,	$1\frac{7}{8} \times \frac{11}{16} \times \frac{3}{8}$,	6 do.	do.
4,	$2\frac{1}{8} \times \frac{3}{4} \times \frac{7}{16}$,	5 do.	do.



Cold Pressed.

SQUARE NUTS.



Hot Pressed.

Manufacturers' Price List.

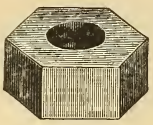
WIDTH.	THICKNESS.	HOLE.	SIZE OF BOLT.	PRICE.	WIDTH.	THICKNESS.	HOLE.	SIZE OF BOLT.	PRICE.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{1}{4}$	23	$1\frac{1}{2}$	$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{3}{4}$	11
$\frac{5}{8}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{1}{4}$	20	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	$\frac{3}{4}$	11
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{5}{16}$	20	$1\frac{5}{8}$	$\frac{1}{8}$	$1\frac{3}{16}$	$\frac{7}{8}$	11
$\frac{3}{4}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	15	$1\frac{3}{4}$	$\frac{1}{8}$	$1\frac{5}{32}$	$\frac{7}{8}$	11
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{11}{32}$	$\frac{3}{8}$	15	$1\frac{3}{4}$	$\frac{7}{8}$	$1\frac{3}{16}$	$\frac{7}{8}$	11
$\frac{7}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{16}$	14	$1\frac{3}{4}$	1	$2\frac{9}{32}$	1	11
$\frac{7}{8}$	$\frac{7}{16}$	$1\frac{3}{32}$	$\frac{7}{16}$	14	2	1	$2\frac{9}{32}$	1	11
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	14	$2\frac{1}{4}$	$1\frac{1}{8}$	1	$1\frac{1}{8}$	11
1	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	12	$2\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	12
1	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	12	$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{4}$	12
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	12	$2\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	12
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	12	3	$1\frac{1}{2}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$12\frac{1}{2}$
$1\frac{1}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	12	$3\frac{1}{4}$	$1\frac{5}{8}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$12\frac{1}{2}$
$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$11\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{9}{16}$	$1\frac{3}{4}$	14
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	$11\frac{1}{2}$	$3\frac{3}{4}$	$1\frac{7}{8}$	$1\frac{11}{16}$	$1\frac{7}{8}$	14
$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{11}{16}$	$\frac{3}{4}$	$11\frac{1}{2}$	4	2	$1\frac{13}{16}$	2	14

Average Contents of each Keg of Nuts, 200 lbs.

Diameter of Bolt, -	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$
No. of Square Nuts, -	2120	1100	700	420	280	180	140	80

MACHINE FORGED NUTS.

WIDTH.	THICKNESS.	HOLE.	SIZE OF BOLT.	PRICE.	WIDTH.	THICKNESS.	HOLE.	SIZE OF BOLT.	PRICE.
$\frac{5}{16}$	$\frac{5}{32}$	$\frac{3}{32}$	$\frac{1}{8}$	50	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	14
$\frac{13}{32}$	$\frac{3}{16}$	$\frac{5}{32}$	$\frac{3}{16}$	30	$1\frac{5}{16}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	12
$\frac{7}{16}$	$\frac{7}{32}$	$\frac{7}{32}$	$\frac{1}{4}$	25	1	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	12
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{7}{32}$	$\frac{1}{4}$	23	1	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	12
$\frac{9}{16}$	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{5}{16}$	20	1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	12
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{5}{16}$	20	$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	12
$\frac{11}{16}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	20	$1\frac{1}{8}$	$\frac{9}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	12
$\frac{3}{4}$	$\frac{11}{32}$	$\frac{11}{32}$	$\frac{3}{8}$	15	$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	$11\frac{1}{2}$
$\frac{13}{16}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{16}$	14	$1\frac{3}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	$1\frac{1}{16}$	$11\frac{1}{2}$
$\frac{1}{8}$	$\frac{7}{16}$	$\frac{13}{32}$	$\frac{7}{16}$	14	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	$\frac{3}{4}$	11
$\frac{7}{8}$	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	14					



Cold Pressed.

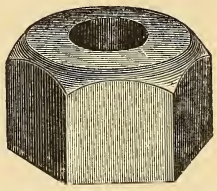
HEXAGON NUTS.

Hot Pressed.

Manufacturers' Price List.

WIDTH.	THICK-NESS.	HOLE.	SIZE OF BOLT.	PRICE.	WIDTH.	THICK-NESS.	HOLE.	SIZE OF BOLT.	PRICE.
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{9}{32}$	$\frac{5}{16}$	26	$1\frac{3}{4}$	$\frac{7}{8}$	$1\frac{3}{16}$	$\frac{7}{8}$	16
$\frac{3}{4}$	$\frac{5}{16}$	$\frac{5}{16}$	$\frac{3}{8}$	21	$1\frac{3}{4}$	1	$1\frac{3}{16}$	$\frac{7}{8}$	16
$\frac{3}{4}$	$\frac{3}{8}$	$1\frac{1}{32}$	$\frac{3}{8}$	21	$1\frac{3}{4}$	1	$\frac{29}{32}$	1	16
$\frac{7}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{7}{16}$	20	$1\frac{3}{4}$	$1\frac{1}{8}$	$\frac{29}{32}$	1	16
$\frac{7}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	20	2	1	$\frac{29}{32}$	1	16
1	$\frac{7}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	18	2	$1\frac{1}{8}$	$\frac{29}{32}$	1	16
1	$\frac{1}{2}$	$\frac{7}{16}$	$\frac{1}{2}$	18	2	$1\frac{1}{4}$	$\frac{29}{32}$	1	16
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$	18	2	$1\frac{1}{4}$	1	$1\frac{1}{8}$	16
$1\frac{1}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	18	$2\frac{1}{4}$	$1\frac{1}{4}$	1	$1\frac{1}{8}$	16
$1\frac{1}{4}$	$\frac{5}{8}$	$\frac{9}{16}$	$\frac{5}{8}$	$16\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{3}{8}$	1	$1\frac{1}{8}$	16
$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{9}{16}$	$\frac{5}{8}$	$16\frac{1}{2}$	$2\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{8}$	$1\frac{1}{4}$	16
$1\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{16}$	$\frac{3}{4}$	$16\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{8}$	17
$1\frac{3}{8}$	$\frac{7}{8}$	$1\frac{1}{16}$	$\frac{3}{4}$	$16\frac{1}{2}$	$2\frac{3}{4}$	$1\frac{5}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	17
$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{16}$	$\frac{3}{4}$	16	3	$1\frac{3}{4}$	$1\frac{7}{16}$	$1\frac{5}{8}$	$17\frac{1}{2}$
$1\frac{1}{2}$	$\frac{7}{8}$	$1\frac{1}{16}$	$\frac{3}{4}$	16	$3\frac{1}{4}$	$1\frac{7}{8}$	$1\frac{9}{16}$	$1\frac{3}{4}$	$17\frac{1}{2}$
$1\frac{5}{8}$	$\frac{7}{8}$	$1\frac{3}{16}$	$\frac{7}{8}$	16	$3\frac{1}{2}$	2	$1\frac{1}{16}$	$1\frac{7}{8}$	19
$1\frac{5}{8}$	1	$1\frac{3}{16}$	$\frac{7}{8}$	16	$3\frac{1}{2}$	2	$1\frac{3}{16}$	2	19

FORGED HEXAGON NUTS.

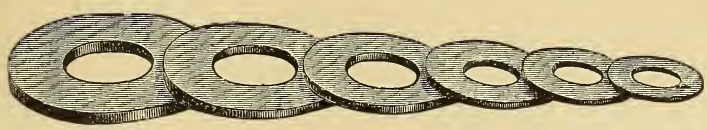


Manufacturers' Price List.

SIZE OF BOLT.	PRICE PER LB.	SIZE OF BOLT.	PRICE PER LB.
$\frac{1}{2}$,	29 cents.	$1\frac{1}{4}$,	20 cents.
$\frac{9}{16}$,	27 do.	$1\frac{3}{8}$,	20 do.
$\frac{5}{8}$,	26 do.	$1\frac{1}{2}$,	20 do.
$\frac{3}{4}$,	21 do.	$1\frac{5}{8}$,	$20\frac{1}{2}$ do.
$\frac{7}{8}$,	20 do.	$1\frac{3}{4}$,	$20\frac{1}{2}$ do.
1,	20 do.	$1\frac{7}{8}$,	$20\frac{1}{2}$ do.
$1\frac{1}{8}$,	20 do.	2,	21 do.

These Nuts are all forged by hand, and are especially adapted to locomotive work and fine machinery. Standard sizes always in stock. Special dimensions made to order. These nuts will tap without injuring the tools.

WASHERS.



150 LB. KEGS.

Standard Sizes — Manufacturers' List.

DIAMETER.	SIZE OF HOLE.	SIZE OF BOLT.	THICKNESS. WIRE GAUGE.	PRICE PER LB.
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{16}$	16	28
$\frac{5}{8}$	$\frac{5}{16}$	$\frac{1}{4}$	16	26
$\frac{3}{4}$	$\frac{3}{8}$	$\frac{5}{16}$	15	24
$\frac{7}{8}$	$\frac{3}{8}$	$\frac{5}{16}$	14	22
1	$\frac{7}{16}$	$\frac{3}{8}$	13	18
$1\frac{1}{8}$	$\frac{1}{2}$	$\frac{7}{16}$	13	15
$1\frac{1}{4}$	$\frac{9}{16}$	$\frac{1}{2}$	12	15
$1\frac{3}{8}$	$\frac{5}{8}$	$\frac{9}{16}$	12	15
$1\frac{1}{2}$	$\frac{11}{16}$	$\frac{5}{8}$	11	15
$1\frac{3}{4}$	$\frac{3}{4}$	$\frac{11}{16}$	11	14
$1\frac{3}{4}$	$\frac{13}{16}$	$\frac{3}{4}$	10	14
2	$\frac{7}{8}$	$\frac{13}{16}$	10	13
2	$\frac{15}{16}$	$\frac{7}{8}$	10	13
2	1	$\frac{15}{16}$	10	13
$2\frac{1}{4}$	$1\frac{1}{8}$	1	9	13
$2\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{8}$	8	13
$2\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{1}{4}$	7	13
3	$1\frac{1}{2}$	$1\frac{3}{8}$	7	13
3	$1\frac{5}{8}$	$1\frac{1}{2}$	6	13
$3\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{5}{8}$	5	13
4	2	$1\frac{3}{4}$	4	13
4	$2\frac{1}{4}$	2	4	13

RIVETING BURRS.

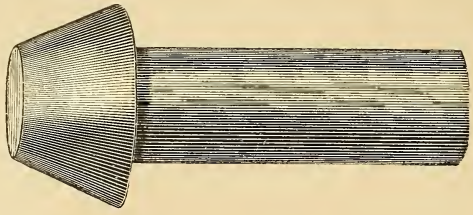
Best Norway Iron.

$\frac{5}{16}$	wire,		per lb.
$\frac{1}{4}$	do.	2 cents extra	do.
$\frac{3}{16}$	do.	4 do.	do.
No. 6	do.	5 do.	do.
No. 7	do.	6 do.	do.
No. 8	do.	7 do.	do.

RIVETS.

BOILER.

100 LBS. PER KEG.



¾ inch diameter, to any length,				
⅝ do.	do.	}	- -	per ℔.
½ do.	do.	- - -	½ cent extra	do.

TANK.

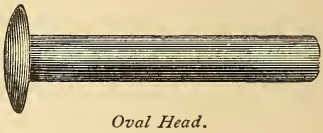
150 LBS. PER KEG.

⅜ inch diameter, to any length,			- - -	per ℔.
5/16 do.	do.	- - -	½ cent extra	do.
¼ do.	do.	- - -	1 do.	do.

WAGON AND CARRIAGE.

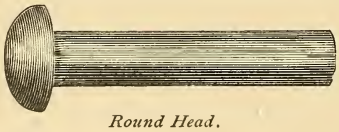
Flat Head.

¼ in. diameter, ½ to 4 in. long.



Oval Head.

5/16 and ¼ in. dia., ½ to 4 in. long.



Round Head.

5/16 and ⅜ in. dia., ½ to 4 in. long.

Cone Head.

¼ in. diameter, ½ to 4 in. long.

Orders for special sizes will have careful attention.

Extras hereinafter named are to be added to rate quoted for ⅜ in. diameter Rivets.

⅜ inch diameter, ½ to 4 inches long,			- -	per ℔.
5/16 do.	do.	- -	1 cent extra	do.
¼ do.	do.	- - -	2 do.	do.
3/16 do.	do.	- -	3 do.	do.

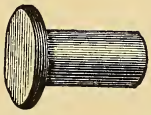
RIVETS—Continued.

WAGON BOX—Large Head.

¼ inch diameter, 1¼ to 2½ inches long, - - 2 cents extra per lb.

WAGON NAILS.

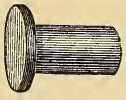
¼ inch diameter, 1¼ to 2 inches long, - - - per lb.



COOPER'S.

IN BULK.

5d. and 6d. - - - - -	Same price as ⅜ in.
3d. and 4d. - - - - -	1 cent extra per lb.
1d. and 2d. - - - - -	2 do. do.



COOPER'S BLACK.

IN BULK.

10 lbs. and 12 lbs. - - - -	2	cents extra	per lb.
8 lbs. and 9 lbs. - - - - -	2½	do.	do.
6 lbs. and 7 lbs. - - - - -	3	do.	do.
5 lbs. - - - - - -	3½	do.	do.
4 lbs. - - - - - -	4	do.	do.
3 lbs. - - - - - -	6	do.	do.
2½ lbs. - - - - - -	7	do.	do.
2 lbs. - - - - - -	8	do.	do.
1¾ lbs. - - - - - -	9	do.	do.
1½ lbs. - - - - - -	11	do.	do.
1¼ lbs. - - - - - -	13	do.	do.
1 lb. - - - - - -	15	do.	do.

RIVETS—Continued.

COOPER'S BLACK.

IN PAPERS OF 1,000.

Extras hereinafter quoted are to be added to 8 oz. Cooper Rivets.

8	oz.			per 1,000.
10	oz.	3 cents extra		do.
12	oz.	6	do.	do.
1	lb.	10	do.	do.
1¼	lb.	14	do.	do.
1½	lb.	18	do.	do.
1¾	lb.	22	do.	do.
2	lbs.	27	do.	do.
2½	lbs.	35	do.	do.
3	lbs.	42	do.	do.
4	lbs.	57	do.	do.
5	lbs.	72	do.	do.
6	lbs.	92	do.	do.
7	lbs.	1.07	do.	do.
8	lbs.	1.22	do.	do.
10	lbs.	1.52	do.	do.
12	lbs.	1.82	do.	do.
14	lbs.	2.12	do.	do.

AGRICULTURAL—Countersunk or Oval Head.

IN PAPERS OF 1,000.

No. 3, wire gauge,				per lb.
4	do.			
5	do.	1 cent extra		do.
6	do.	1	do.	do.
7	do.	2	do.	do.
8	do.	3	do.	do.

Extra lengths, 5 cents per 1,000 extra.

BOLTS.

CARRIAGE AND SQUARE HEAD BOLTS.

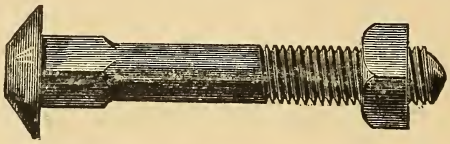
With Forged Nuts.

Price per 100.

LENGTH.	¼ in	5/16 in.	⅜ in.	7/16 in.	½ in.	⅝ in.
1¼ and 1½ inch.	2 40	2 70	3 60	5 10	6 80	11 00
1¾	2 45	2 80	3 70	5 25	7 00	11 37
2	2 50	2 90	3 70	5 40	7 20	11 63
2¼	2 55	3 00	3 82	5 55	7 40	12 00
2½	2 60	3 10	3 95	5 70	7 60	12 37
2¾	2 65	3 20	4 08	5 85	7 80	12 63
3	2 70	3 30	4 20	6 00	8 00	13 00
3¼	2 75	3 40	4 32	6 15	8 20	13 38
3½	2 80	3 50	4 45	6 30	8 40	13 75
3¾	2 85	3 60	4 58	6 45	8 60	14 12
4	2 90	3 70	4 70	6 60	8 80	14 50
4¼	2 95	3 80	4 83	6 75	9 00	14 88
4½	3 00	3 90	4 95	6 90	9 20	15 25
4¾	3 05	4 00	5 07	7 05	9 40	15 62
5	3 10	4 10	5 20	7 20	9 60	16 00
5½	3 20	4 30	5 45	7 50	10 00	16 75
6	3 30	4 50	5 70	7 80	10 40	17 50
6½	3 40	4 70	5 95	8 10	10 80	18 25
7	3 50	4 90	6 20	8 40	11 20	19 00
7½		5 10	6 45	8 70	11 60	19 75
8		5 30	6 70	9 00	12 00	20 50
8½		5 50	6 95	9 30	12 40	21 25
9		5 70	7 20	9 60	12 80	22 00
9½			7 45	9 90	13 20	22 75
10			7 70	10 20	13 60	23 50
10½			7 95	10 50	14 00	24 25
11			8 20	10 80	14 40	25 00
11½				11 10	14 80	25 75
12				11 40	15 20	26 50
12½					15 60	27 25
13					16 00	28 00
14					16 80	29 50

Common Manufacture, - - per cent. discount.

BOLTS—Continued.



RUSSELL, BURDSALL & WARD'S CARRIAGE BOLTS.

With Forged Nuts.

Price per 100.

LENGTH.	¼ in.	5/16 in.	⅜ in.	7/16 in.	½ in.	⅝ in.
1¼ and 1½ inch.	2 40	2 70	3 60	5 10	6 80	11 00
1¾	2 45	2 80	3 70	5 25	7 00	11 37
2	2 50	2 90	3 70	5 40	7 20	11 63
2¼	2 55	3 00	3 82	5 55	7 40	12 00
2½	2 60	3 10	3 95	5 70	7 60	12 37
2¾	2 65	3 20	4 08	5 85	7 80	12 63
3	2 70	3 30	4 20	6 00	8 00	13 00
3¼	2 75	3 40	4 32	6 15	8 20	13 38
3½	2 80	3 50	4 45	6 30	8 40	13 75
3¾	2 85	3 60	4 58	6 45	8 60	14 12
4	2 90	3 70	4 70	6 60	8 80	14 50
4¼	2 95	3 80	4 83	6 75	9 00	14 88
4½	3 00	3 90	4 95	6 90	9 20	15 25
4¾	3 05	4 00	5 07	7 05	9 40	15 62
5	3 10	4 10	5 20	7 20	9 60	16 00
5½	3 20	4 30	5 45	7 50	10 00	16 75
6	3 30	4 50	5 70	7 80	10 40	17 50
6½	3 40	4 70	5 95	8 10	10 80	18 25
7	3 50	4 90	6 20	8 40	11 20	19 00
7½		5 10	6 45	8 70	11 60	19 75
8		5 30	6 70	9 00	12 00	20 50
8½		5 50	6 95	9 30	12 40	21 25
9		5 70	7 20	9 60	12 80	22 00
9½			7 45	9 90	13 20	22 75
10			7 70	10 20	13 60	23 50
10½			7 95	10 50	14 00	24 25
11			8 20	10 80	14 40	25 00
11½				11 10	14 80	25 75
12				11 40	15 20	26 50
12½					15 60	27 25
13					16 00	28 00
14					16 80	29 50

per cent. discount.

BOLTS—Continued.

TIRE BOLTS,

Made from Charcoal Iron with Forged Nuts.

Price per 100.

LENGTH.	$\frac{3}{16}$ and $\frac{1}{4}$ in.	$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.
$1\frac{1}{4}$ } $1\frac{1}{2}$ }	1 40	2 50	3 20		
$1\frac{3}{4}$	1 45	2 50	3 20		
2	1 50	2 50	3 20		
$2\frac{1}{4}$	1 55	2 58	3 30		
$2\frac{1}{2}$	1 60	2 65	3 40		
$2\frac{3}{4}$	1 65	2 73	3 50		
3	1 70	2 80	3 60	5 30	6 60
$3\frac{1}{4}$	1 75	2 88	3 70	5 45	6 80
$3\frac{1}{2}$	1 80	2 95	3 80	5 65	6 98
$3\frac{3}{4}$	1 90	3 03	4 00	5 83	7 17
4	1 90	3 03	4 00	6 00	7 40
$4\frac{1}{4}$		3 18	4 20	6 20	7 55
$4\frac{1}{2}$		3 18	4 20	6 35	7 75
$4\frac{3}{4}$		3 33	4 40	6 55	7 93
5		3 33	4 40	6 73	8 12
$5\frac{1}{4}$				6 91	8 31
$5\frac{1}{2}$				6 95	8 50

Common manufacture, - - - per cent. discount.
Russell, Burdsall & Ward's manufacture, - do. do.

SLEIGH BOLTS.

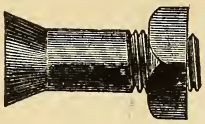
Same as Carriage Bolt List.

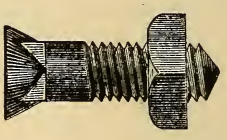
ELEVATOR BOLTS.

$\frac{3}{4} \times \frac{3}{16}$ inch,	- - - - -	1.50 per 100.
$\frac{7}{8} \times \frac{3}{16}$ do.	- - - - - -	1.50 do.
1 $\times \frac{3}{16}$ do.	- - - - -	1.50 do.
$1\frac{1}{8} \times \frac{3}{16}$ do.	- - - - - -	1.50 do.

BOLTS—Continued.

PLOW BOLTS—With Forged Nuts.





Russell, Burdsall & Ward's Round or Square Countersunk Heads, and with right or left hand thread as may be ordered.

Price per 100.

DIAMETER.	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4
5/16 inch,	1 70	1 80	1 90	2 00	2 10	2 20	2 30	2 40	2 50	2 60	2 70	2 80
3/8 do.	2 00	2 10	2 20	2 30	2 40	2 50	2 60	2 70	2 80	2 90	3 00	3 10
7/16 do.	2 60	2 75	2 90	3 05	3 20	3 35	3 50	3 65	3 80	3 95	4 10	4 25
1/2 do.	3 50	3 70	3 90	4 10	4 30	4 50	4 70	4 90	5 10	5 30	5 50	5 70

per cent. discount.

IN BULK.

5/8 inch, all lengths,	-	-	-	-					per lb.
9/16 do.	do.	-	-	-	-	1	cent extra		do.
1/2 do.	do.	-	-	-		1	do.		do.
7/16 do.	do.	-	-	-	-	2	do.		do.
3/8 do.	do.	-	-	-		3	do.		do.
5/16 do.	do.	-	-	-	-	10	do.		do.

COAL CAR OR PIT BOLTS.

2 × 1/2 inch,	-	-	-	-	-	-	7.20	per 100.
2¼ × 1/2 do.	-	-	-	-	-	-	7.40	do.
2½ × 1/2 do.	-	-	-	-	-	-	7.60	do.
2¾ × 1/2 do.	-	-	-	-	-	-	7.80	do.
3 × 1/2 do.	-	-	-	-	-	-	8.00	do.
3¼ × 1/2 do.	-	-	-	-	-	-	8.20	do.
3½ × 1/2 do.	-	-	-	-	-	-	8.40	do.
3 × 5/8 do.	-	-	-	-	-	-	13.00	do.
3½ × 5/8 do.	-	-	-	-	-	-	13.75	do.

BOLTS—Continued.

SQUARE HEAD OR MACHINE.

Price per 100.

LENGTH.	¼ in.	5/16 in.	⅜ in.	7/16 in.	½ in.	9/16 in.	⅝ in.	¾ in.
1½	2 90	3 00	3 25	3 70	4 40	5 22	6 50	10 20
1¾	2 95	3 05	3 30	3 75	4 45	5 30	6 60	10 30
2	3 00	3 10	3 35	3 80	4 50	5 38	6 70	10 40
2¼	3 05	3 15	3 40	3 85	4 55	5 46	6 80	10 50
2½	3 10	3 20	3 45	3 90	4 60	5 54	6 90	10 60
2¾	3 15	3 25	3 50	3 95	4 65	5 62	7 00	10 70
3	3 20	3 30	3 55	4 00	4 70	5 70	7 10	10 80
3½	3 30	3 40	3 65	4 10	4 80	5 86	7 30	11 00
4	3 40	3 50	3 75	4 20	4 90	6 02	7 50	11 20

Machine Bolts longer than Four Inches.

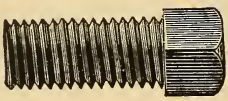
DIAMETERS.	OVER 4 TO 6 IN. LONG.	OVER 6 TO 12 IN. LONG.
⅜ inch,	17 cents per lb.	16 cents per lb.
7/16 do	16 do.	15 do.
½ do.	15 do.	14 do.
9/16 do.	14 do.	13½ do.
⅝ do.	13 do.	12½ do.
¾ do.	12¾ do	12¼ do.
⅞ and 1 inch,		

Countersunk or Button-head Bolts the same price as those with Square Heads.

The above prices refer exclusively to Bolts with square heads and nuts. Bolts with hexagon heads and square nuts, or square heads and hexagon nuts, 10 per cent. extra. With both hexagon heads and nuts, 20 per cent. extra.

BOLTS—Continued.

SET SCREWS AND TAP BOLTS—Threaded.

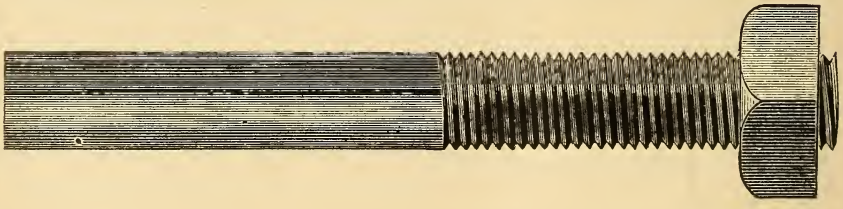


Price per 100.

LENGTH.	¼ in.	5/16 in.	⅜ in.	7/16 in.	½ in.	9/16 in.	⅝ in.	¾ in.
1½ inch.	2 60	2 70	2 85	3 20	3 80	4 40	5 40	7 10
1¾ "	2 65	2 75	2 90	3 25	3 85	4 50	5 50	7 25
2 "	2 70	2 80	2 95	3 30	3 90	4 60	5 60	7 40
2¼ "	2 75	2 85	3 00	3 35	3 95	4 70	5 70	7 55
2½ "	2 80	2 90	3 05	3 40	4 00	4 80	5 80	7 70
2¾ "	2 85	2 95	3 10	3 45	4 05	4 90	5 90	7 85
3 "	2 90	3 00	3 15	3 50	4 10	5 00	6 00	8 00

This list refers exclusively to Set Screws and Tap Bolts with square heads. Those with hexagon heads will be charged 10 per cent. extra. Blank Set Screws, and Tap Bolts, 5 per cent. less than the above list.

BRIDGE BOLTS AND BOLT ENDS.



1 to 2¼ inch diameter, over 8 ft. long, - - - per lb.
1 to 2¼ do. do. from 4 to 8 ft. long, - ¼ cent extra do.
1 to 2¼ do. do. from 1½ to 4 ft. long, - ¾ do. do.
⅝ to ⅞ do. do. over 4 ft. long, - - 1½ do. do.
⅝ to ⅞ do. do. from 1½ to 4 ft. long, - 2 do. do.

BOLTS — Continued.

LAG SCREWS AND SKEIN BOLTS.

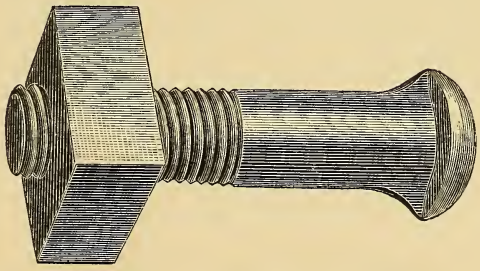
$\frac{3}{4}$ and $\frac{5}{8}$ in. diameter, 3 to 9 in. long,					per ℔.
$\frac{9}{16}$	do.	do.	1 cent extra		do.
$\frac{1}{2}$	do.	do.	2	do.	do.
$\frac{7}{16}$	do.	do.	6	do.	do.
$\frac{3}{8}$	do.	do.	9	do.	do.

All Bolts shorter than 3 in. long, 2 cents extra per ℔.

PATENT GIMLET POINTED COACH SCREWS.

$\frac{5}{8}$ in. diameter, 3 in. long,					per ℔.
$\frac{9}{16}$	do.	do.	$1\frac{1}{2}$ cents extra		do.
$\frac{1}{2}$	do.	do.	$1\frac{1}{2}$	do.	do.
$\frac{7}{16}$	do.	do.	5	do.	do.
$\frac{3}{8}$	do.	do.	7	do.	do.
$\frac{5}{16}$	do.	do.	18	do.	do.

Over 3 inches long, 2 cents less per ℔.



FISH PLATE BOLTS.

$\frac{3}{4}$ in. diameter,	per ℔.
$\frac{13}{16}$ do.	do.

TURNBUCKLES.

$1\frac{1}{8}$ and larger,			per ℔.
1,	1 cent extra		do.
$\frac{7}{8}$,	2	do.	do.
$\frac{3}{4}$,	4	do.	do.
$\frac{5}{8}$,			each.
$\frac{1}{2}$,			each.

PATENT GIMLET SCREWS.

IRON.

½ Inch.	Cts.
No. 2 @	29
3 "	29
4 "	29
5 "	30
6 "	32
7 "	36
8 "	39
9 "	44
10 "	47

⅝ Inch.	Cts.
No. 2 @	30
3 "	30
4 "	32
5 "	33
6 "	36
7 "	39
8 "	44
9 "	47
10 "	50
11 "	53
12 "	56

¾ Inch.	Cts.
No. 4 @	33
5 "	36
6 "	39
7 "	42
8 "	45
9 "	48
10 "	51
11 "	54
12 "	57
13 "	66
14 "	72
15 "	84
16 "	96

⅞ Inch.	Cts.
No. 5 @	39
6 "	41
7 "	44
8 "	47
9 "	50
10 "	53
11 "	57
12 "	62
13 "	69
14 "	75
15 "	87
16 "	98

1 Inch.	Cts.
No. 5 @	44
6 "	45
7 "	48
8 "	50
9 "	53
10 "	56
11 "	60
12 "	65
13 "	72
14 "	80
15 "	90
16 "	102
17 "	113
18 "	126
20 "	174

1¼ Inch.	
No. 7 @	56
8 "	57
9 "	60
10 "	65
11 "	69
12 "	75
13 "	83
14 "	92
15 "	105
16 "	120
17 "	129
18 "	141
20 "	176

1½ Inch.	
No. 8 @	65
9 "	68
10 "	71
11 "	77
12 "	83
13 "	92
14 "	105
15 "	119
16 "	132
17 "	146
18 "	158
20 "	189

1¾ Inch.	
No. 9 @	78
10 "	81
11 "	86
12 "	95
13 "	105
14 "	119
15 "	132
16 "	146
17 "	159
18 "	176
20 "	201
22 "	225
24 "	278

2 Inch.	
No. 10 @	86
11 "	93
12 "	107
13 "	119
14 "	132
15 "	146
16 "	159
17 "	176
18 "	189
20 "	219
22 "	254
24 "	338

2¼ Inch.	
No. 11 @	107
12 "	120
13 "	134
14 "	146
15 "	159
16 "	177
17 "	189
18 "	206
20 "	236
22 "	288
24 "	375

2½ Inch.	
No. 12 @	134
13 "	146
14 "	159
15 "	177
16 "	189
17 "	206
18 "	219
20 "	254
22 "	315
24 "	390

2¾ Inch.	
No. 13 @	159
14 "	176
15 "	189
16 "	206
17 "	233
18 "	251
20 "	300
22 "	369
24 "	443

3 Inch.	
No. 14 @	189
15 "	206
16 "	233
17 "	260
18 "	288
20 "	342
22 "	420
24 "	510
26 "	570

3½ Inch.	
No. 16 @	282
17 "	314
18 "	351
20 "	431
22 "	500
24 "	554
26 "	608

4 Inch.	
No. 18 @	414
20 "	519
22 "	585
24 "	645
26 "	720

4½ Inch.	
No. 18 @	480
20 "	579
22 "	645
24 "	720
26 "	810

5 Inch.	
No. 20 @	675
22 "	750
24 "	810
26 "	900

6 Inch.	
No. 24 @	1012
26 "	1163
28 "	1358
30 "	1575

PATENT GIMLET SCREWS.

BRASS.

½ Inch.	Cts.	⅝ inch.	Cts.	¾ Inch.	Cts.	⅞ Inch.	Cts.	1 Inch.	Cts.
No. 2 @	89	No. 2 @	90	No. 4 @	96	No. 6 @	110	No. 6 @	114
3 "	89	3 "	90	5 "	101	7 "	119	7 "	126
4 "	92	4 "	93	6 "	107	8 "	129	8 "	140
5 "	96	5 "	98	7 "	114	9 "	141	9 "	155
6 "	102	6 "	104	8 "	123	10 "	156	10 "	173
7 "	111	7 "	113	9 "	135	11 "	174	11 "	194
8 "	119	8 "	120	10 "	149	12 "	195	12 "	218
9 "	129	9 "	131	11 "	164	13 "	228	13 "	245
10 "	143	10 "	144	12 "	180	14 "	267	14 "	275
		11 "	159	13 "	203	15 "	305	15 "	308
		12 "	180	14 "	233	16 "	345	16 "	353
				15 "	270			18 "	413
				16 "	315				

1¼ Inch.		1½ Inch.		1¾ Inch.		2 Inch.		2¼ Inch.	
No. 7 @	135	No. 8 @	188	No. 9 @	245	No. 10 @	300	No. 12 @	413
8 "	146	9 "	209	10 "	269	11 "	327	13 "	470
9 "	173	10 "	231	11 "	293	12 "	357	14 "	531
10 "	203	11 "	258	12 "	324	13 "	416	15 "	590
11 "	233	12 "	288	13 "	365	14 "	474	16 "	645
12 "	263	13 "	323	14 "	414	15 "	533	17 "	705
13 "	293	14 "	363	15 "	473	16 "	591	18 "	780
14 "	323	15 "	413	16 "	540	17 "	650	20 "	870
15 "	353	16 "	465	17 "	617	18 "	708	22 "	1125
16 "	383	17 "	525	18 "	702	20 "	834		
17 "	413	18 "	600	20 "	810	22 "	1050		
18 "	450	20 "	780	22 "	960	24 "	1200		
20 "	525			24 "	1125				

IRON MACHINE SCREWS.

	24 AND 32 THREADS PER INCH.			20 AND 24 THREADS PER IN.		16 AND 18 THREADS PER INCH.			
Nos.	6	8	10	12	14	16	18	20	24
	CTS.	CTS.	CTS.	CTS.	CTS.	CTS.	CTS.	CTS.	CTS.
⅜ Inch.	68	75	83	...	...	...	...	...	...
½ "	68	75	83	90	113	135	...	...	...
⅝ "	..	75	83	90	113	135	158	195	...
¾ "	..	75	83	98	120	143	173	210	...
⅞ "	..	..	90	105	128	150	188	225	...
1 "	..	..	98	113	135	165	203	240	300
1¼ "	..	..	..	120	143	180	218	255	330
1½ "	..	..	..	...	150	195	233	270	360

PICKS.

WASHOE PATTERN.

COAL DRIFTING.

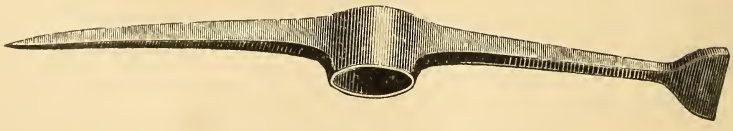
No. 1	17½ in. long,	weighs 2½ lbs.	-	-	$9 per doz.
2	18 do.	do. 3 do.	-	-	10 do.
3	20 do.	do. 4 do.	-	-	11 do.
4	21 do.	do. 5 do.	-	-	13 do.
5	23 do.	do. 6 do.	-	-	15 do.

COAL POLL.

No. 1	13 in. long,	weighs 3 lbs.	-	-	$14 per doz.
2	14 do.	do. 4 do.	-	-	15 do.
3	15½ do.	do. 4½ do.	-	-	16 do.
4	17 do.	do. 5½ do.	-	-	17 do.

RAILROAD.

No. 1	23 in. long,	weighs 4½ lbs.	-	-	$14 per doz.
2	25 do.	do. 5 do.	-	-	15 do.
3	27 do.	do. 6 do.	-	-	16 do.
4	29 do.	do. 6½ do.	-	-	17 do.
5	31 do.	do. 7½ do.	-	-	18 do.



TAMPING.

No. 10	24 in. long, 2¼ × ⅝,	weighs 7 lbs.	- - $20 per doz.

PICKS—Continued.

COAL.

No. 11—5½ × 3¾ in. long, weighs 3 lbs. - - $17 per doz.
12—6 × 4¾ do. do. 4½ do. - - 18 do.

GOLD MINERS' DRIFTING.

No. 1—17 in. long, weighs 4 lbs. - - - $15 per doz.
2—20 do. do. 4½ do. - - - 15 do.
3—22 do. do. 4½ do. - - - 15 do.
4—22 do. do. 4½ do. - - - 16 do.
5—23 do. do. 6 do. - - - 18 do.

GOLD MINERS' POLL.

No. 1—13½ in. long, weighs 3½ lbs. - - - $15 per doz.
2—14 do. do. 4 do. - - 15 do.
3—15 do. do. 4½ do. - - - 15 do.
4—17 do. do. 5¼ do. - - 16 do.
5—18 do. do. 6 do. - - - 18 do.
6—21¾ do. do. 6¾ do. - - 24 do.

MATTOCKS.

No. 8—9 × 3 × 3 inches, axe finish,
Long Cutter,
Short Cutter,
} 6 lbs. - - $17 per doz.

PICKS—Continued.

STONE.

No. 16—21 inches long, weighs 5 lbs. - - - $18 per doz.

PICK AXES.

No. 9—8½ × 3¼ inches, weighs 5½ lbs. - - - $18 per doz.
10 × 3 do. 6 do. - - 18 do.

ICE PICKS.

No. 6—6¼ × 2½ inches, weighs 2½ lbs. - - - $15 per doz.

SLATE PICKS.

No. 7—21 inches long, weighs 5 lbs. - - - $18 per doz.

MILL PICKS.

Cracking and furrowing, 3 lbs. and over, - - per lb.
do. do. under 3 lbs. - 10 cents extra do.

PICKS—Continued.

PICK EYES.

No. 13—2½ lbs. each,	- - - - -	$6 per doz.
3 do.	- - - -	7 do.
3½ do.	- - - - -	7½ do.
4 do.	- - - -	8 do.
4½ do.	- - - - -	9 do.
5 do.	- - - -	10 do.
No. 14—6 do.	- - - - -	11 do.
7 do.	- - - -	13 do.
8 do.	- - - - -	14 do.
9 do.	- - - -	16 do.

STEEL FOR PICK EYES.

Any size or weight required, - - - - per lb.

STONE—Common.

Axe finish, 8 lbs. - - - - -	$18 per doz.
Common finish, 8 lbs. - - - -	17 do.

COMMON.

No. 5 to 6—Common finish, - - -	$11.50 per doz.
7 to 7½ do. - - - -	12.00 do.
4 to 5—Axe finish, - - -	13.00 do.
5 to 6 do. - - - -	13.50 do.
6 to 7 do. - - -	14.00 do.

CROWBARS.

SINGLE.

Steel pointed, - - - - - - per lb.
Solid steel, - - - - - do.

DOUBLE.

Steel pointed, - - - - - - per lb.
Solid steel, - - - - - do.

PINCH BAR.

Steel pointed, - - - - - - per lb.
Solid steel, - - - - - do.

PINCH BAR—With Heel.

Steel pointed, - - - - - - per lb.
Solid steel, - - - - - do.

LINING BAR.

Steel pointed, - - - - - - per lb.
Solid steel, - - - - - do.

TAMPING BAR.

Steel pointed, - - - - - per lb.
Solid steel, - - - - - do.

CROWBARS—Continued.

CLAW BAR—Single Heel.

Steel pointed, - - - - - per lb.
Solid steel, - - - - - do.

CLAW BAR—Double Heel.

Steel pointed, - - - - - per lb.
Solid steel, - - - - - do.

DRILLS.

FEATHER.

Steel pointed, - - - - - per lb.
Solid steel, - - - - - do.

CHURN.

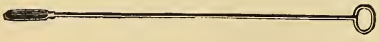
Steel pointed, - - - . - per lb.
Solid steel, - - - - - do.

SOCKET.

Solid steel, - - - - - - per lb.

JUMPER.

Solid steel, - - - - - per lb.



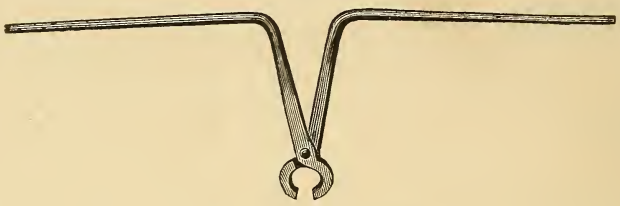
SPOONS.

Solid steel, - each.

NEEDLES.

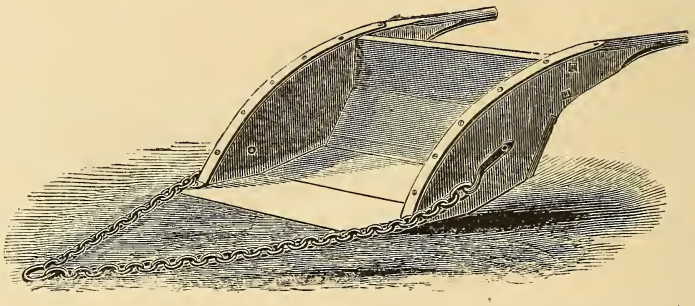
Solid steel, - each.

MISCELLANEOUS.



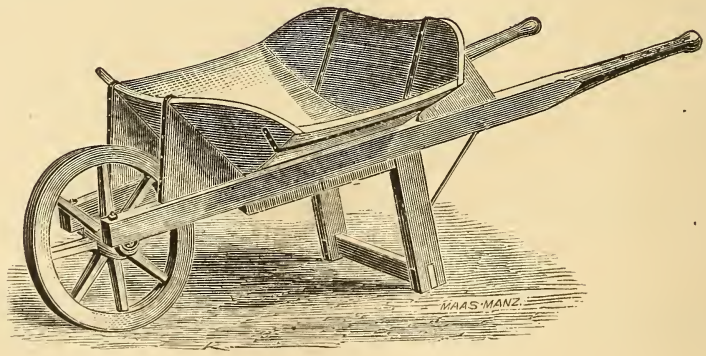
RAIL TONGS.

Cast Steel Jaws, - - - - - - each.



ROAD SCRAPERS.

Cast Steel Bottoms, - - - - each.



WHEELBARROWS.

Canal, - - - - - - per doz.
Garden, - - - - - - do.

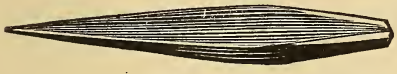
MISCELLANEOUS—Continued.

HARROW TEETH.

1 inch square, - - - - per ℔.
⅞ do. } - - - - ¼ cent extra do.
¾ do. }
⅝ do. - - - - ½ do. do.

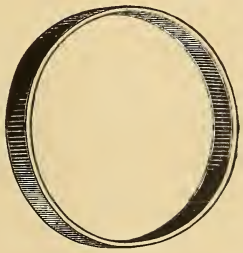
WOODCHOPPERS' WEDGES.

Iron, fluted, 3½ to 8 ℔s. each, - - - per ℔.
Steel, solid, fluted, do. - - do.



COAL MINERS' WEDGES.

Steel, solid, 2 to 3 ℔s. each. - - - - per ℔.



BEETLE RINGS.

Made from Refined Iron, - - - - per ℔.

MISCELLANEOUS—Continued.

LAP RINGS.

$\frac{5}{8}$	inch iron,	-	-	-	-	-							per ℔.
$\frac{9}{16}$	do.	-	-	-	-	-	-	$\frac{1}{2}$	cent extra				do.
$\frac{1}{2}$	do.	-	-	-	-	-		$1\frac{1}{2}$	do.				do.
$\frac{7}{16}$	do.	-	-	-	-	-	-	$2\frac{1}{2}$	do.				do.
$\frac{3}{8}$	do.	-	-	-	-	-		4	do.				do.
$\frac{5}{16}$	do.	-	-	-	-	-	-	6	do.				do.
$\frac{1}{4}$	do.	-	-	-	-	-		8	do.				do.

CHAINS.

STRAIGHT COIL.

TWIST COIL.

Extras hereinafter named are to be added to price quoted for common size, viz.: $1\frac{1}{4}$ inch.

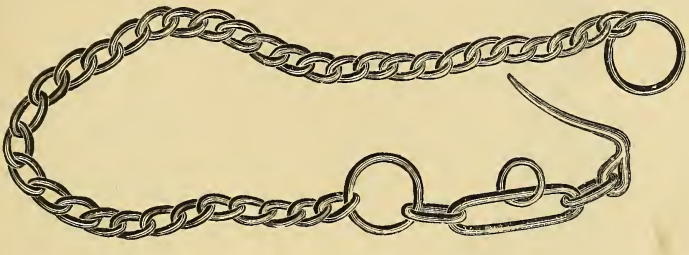
SIZE OF CHAIN.	WEIGHT PER FATHOM.	PRICE. COMMON.	PRICE. BEST SHORT LINK.	PRICE. BEST CRANE.	PROOF TONS.
$1\frac{1}{4}$ inch,	90				28
$1\frac{3}{16}$ do.	82				26
$1\frac{1}{8}$ do.	74	$\frac{1}{4}$ c. extra.	$\frac{1}{4}$	$\frac{1}{4}$	23
$1\frac{1}{16}$ do.	67				20
1 do.	60				18
$\frac{15}{16}$ do.	54	$\frac{3}{4}$ do.	$\frac{3}{4}$	$\frac{3}{4}$	16
$\frac{7}{8}$ do.	47				14
$\frac{13}{16}$ do.	40	1 do.	1	1	12
$\frac{3}{4}$ do.	35				10
$\frac{11}{16}$ do.	30	$1\frac{3}{4}$ do.	$1\frac{3}{4}$	$1\frac{3}{4}$	8
$\frac{5}{8}$ do.	26				6
$\frac{9}{16}$ do.	20	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	5
$\frac{1}{2}$ do.	16	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	4
$\frac{7}{16}$ do.	12	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	2
$\frac{3}{8}$ do.	9	4	4	4	$1\frac{1}{2}$
$\frac{5}{16}$ do.	$6\frac{1}{2}$	5	5	5	1
$\frac{1}{4}$ do.	$4\frac{1}{2}$	6	6	6	$\frac{3}{4}$
$\frac{3}{16}$ do.	$3\frac{1}{2}$	10	10	10	$\frac{1}{2}$

We have constantly in store a full assortment of Common, Proof and Best Best Chains, made from refined iron of great tensile strength (above 60,000 lbs. to the square inch). Our manufacturing facilities enable us to execute orders promptly for either Straight, Twist Link or Chains to any pattern. (See list.)

CHAINS—Continued.

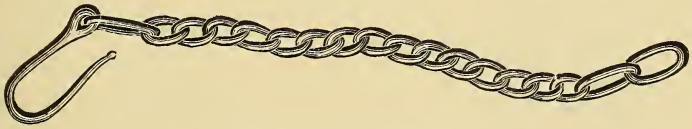
Binding Chains,	per lb.
Breast Chains,	do.
Break Chains,	do.
Beetle Rings,	do.
Back Chains,	do.
Bed Chains,	do.
Breeching Chains,	do.
Car-brake Chains,	do.
Colter Chains,	do.
Crane Chains,	do.
Cow Ties,	do.
Drill Chains,	do.
Ditching Chains,	do.
Double Tree Rings,	do.
Fence Chains,	do.
Hoisting Chains,	do.
Hitching Rings,	do.
Jockey Chains,	do.
Jack Chains,	do.
Log Chains,	do.
Lock Chains,	do.
Neck Yoke Rings,	do.
Oval Link Chains,	do.
Pole Chains,	do.
Pulley Block Chains,	do.
Rest Chains,	do.
Single Tree Rings,	do.
Studded Chains,	do.
Scraper Chains,	do.
Shaft Chains,	do.
Stump Chains,	do.
Stage Chains,	do.
Stay Chains,	do.
Ship Chains,	do.
Spreading Chains,	do.
Twisted Chains,	do.
Trap Chains,	do.
Trace Chains,	do.
Tongue Chains,	do.

CHAINS — Continued.



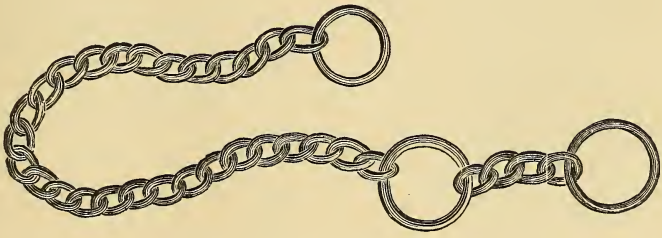
LOCK-CHAIN.

$\frac{1}{4}$ in., with $\frac{3}{8}$ in. Rings, - - - -	per ℔.
$\frac{5}{16}$ do. $\frac{1}{2}$ do. - - - -	do.



STAY-CHAIN.

$\frac{1}{4}$ in., with $\frac{3}{8}$ in. Hook, - - - -	per ℔.
$\frac{5}{16}$ do. $\frac{1}{2}$ do. - - - -	do.

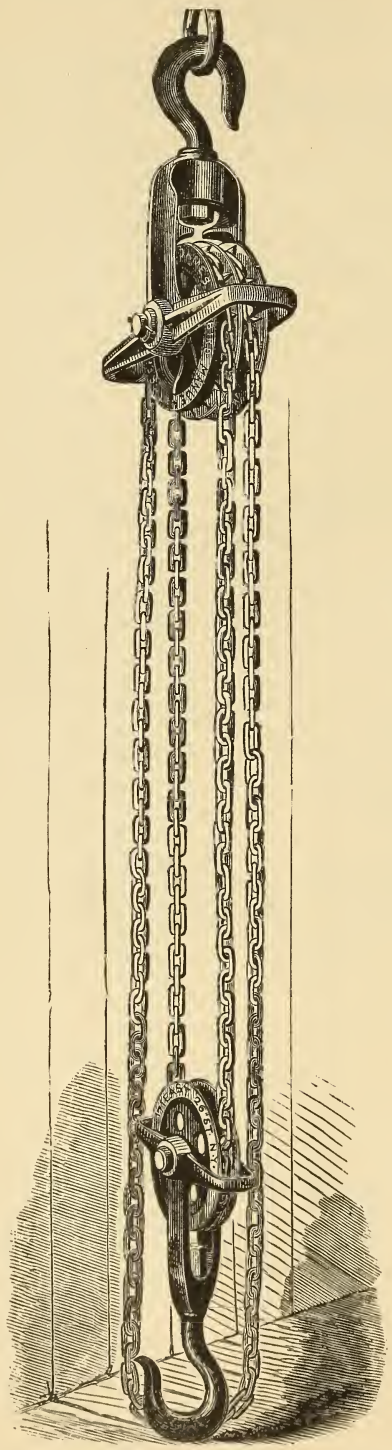


POLE-CHAIN.

$\frac{1}{4}$ in., with $\frac{3}{8}$ in. Rings, - - - -	per ℔.
$\frac{5}{16}$ do. $\frac{1}{2}$ do. - - - -	do.

CATTLE TIES.

$\frac{3}{16}$ in., Twist Link, - - - - -	per ℔.
$\frac{1}{4}$ do. Straight do. - - - -	do.



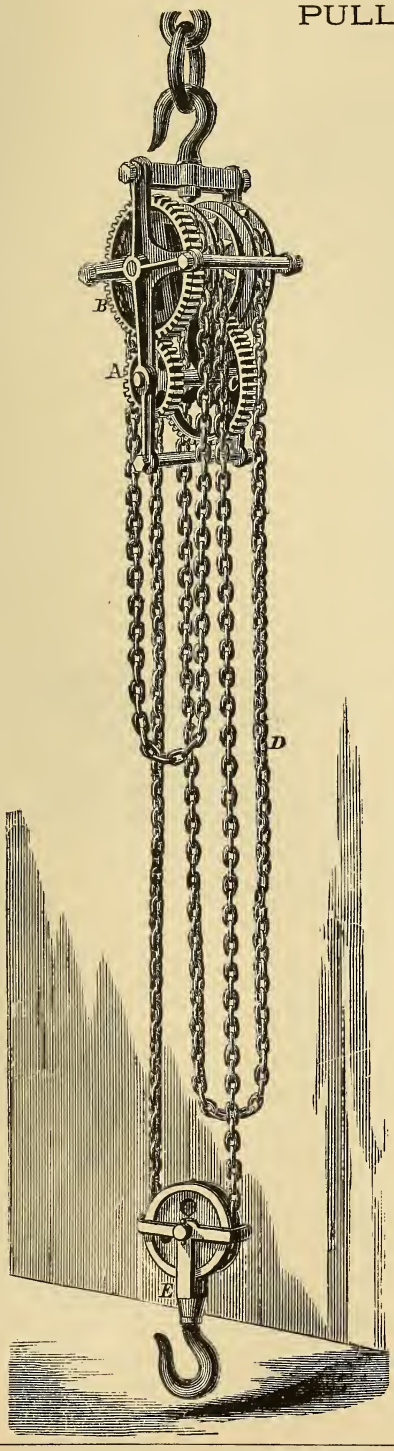
PULLEY BLOCKS.

DIFFERENTIAL PULLEY BLOCKS.

One trial will prove the superior merits of this Pulley Block over all others. One man can hoist from 500 to 1,000 lbs. with comparative ease, and the block will hold at any point.

SIZE OF BLOCK.	NO. FEET OF CHAIN IN EACH BLOCK.	PRICE OF EACH.	PRICE OF ADDITIONAL CHAIN PER FT.
½ ton,	26	$25	40 cents.
1 do.	30	30	45 do.
1½ do.	34	40	50 do.
2 do.	38	50	55 do.

PULLEY BLOCKS—Continued.



DIFFERENTIAL PULLEY BLOCKS.

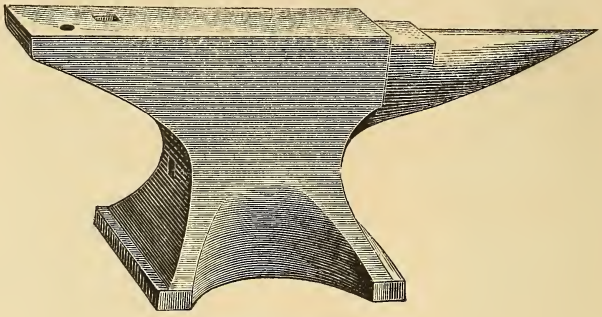
The peculiar merit of the Chain Blocks is that they retain more power than the plain block. They gain according to the double gear and extra chain. One man can hoist from one to three tons, and the block will hold the weight at any point.

In ordering, state the height of lift and weight, as blocks are priced as above with same number of feet of chain.

All orders promptly filled.

SIZE OF BLOCK.	No. of Feet of Chain in each Block.	No. of Feet of Hand Chain in each Block.	PRICE.	Additional Chain per foot.	
				Block Chain.	Hand Chain for hauling.
1 ton,	30	20	$ 50	45 c.	40 c.
2 do.	30	20	120	55	40
3 do.	30	20	160	60	40
4 do.	30	20	180	70	40
5 do.	30	20	200	90	40

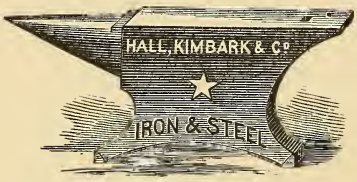
ANVILS.



WROUGHT IRON—Steel Face.

Imported.

Peter Wright's Patent, - - - - -	per lb.
Armitage & Co. (Mousehole), - - -	do.



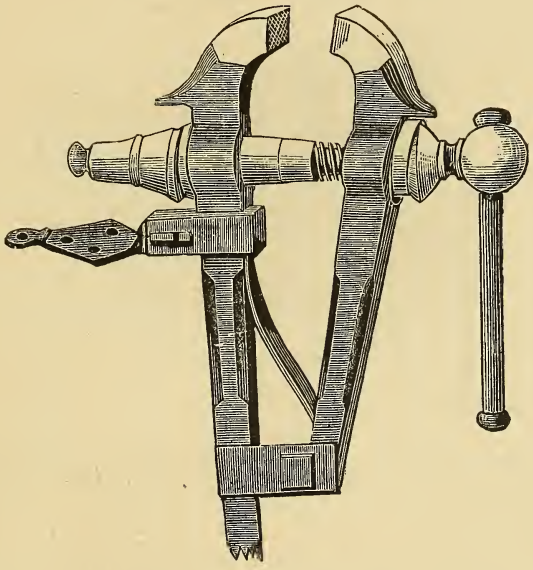
CAST IRON—Steel Face.

American.

No. 0	Weighing about	10 lbs.	$4.00
1	do.	15 do.	4.75
2	do.	20 do.	5.50
3	do.	30 do.	6.25
4	do.	40 do.	7.00
5	do.	50 do.	7.75
6	do.	60 do.	8.75
7	do.	70 do.	9.75
8	do.	80 do.	10.75
9	do.	90 do.	11.75

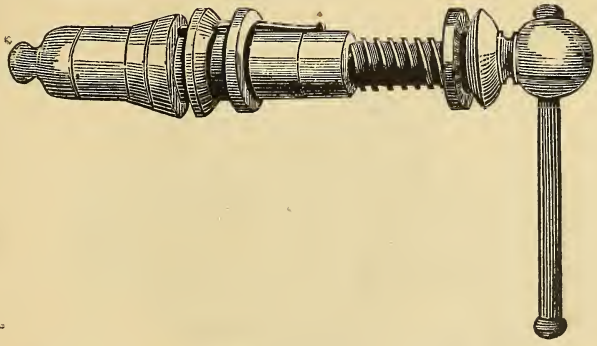
Anvils weighing from	100 lbs.	and upwards to 210 lbs.	per lb.
do.	do.	210 lbs. do. 320 lbs.	1 cent extra do.
do.	over	320 lbs. - - -	2 do. do.

VISES.



SOLID BOX.

Peter Wright's, imported,	per lb.
Hall, Kimbark & Co.'s,	do.
Ordinary make,	do.

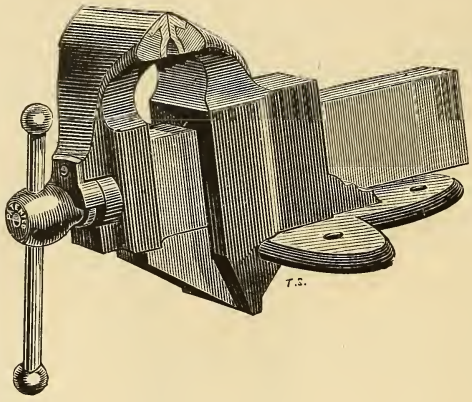


VISE BOXES AND SCREWS.

For 30 to 40 lbs. Vise,		each.
40 to 60	do.	50 cts. extra do.
60 to 80	do.	$1.25 do. do.
80 to 100	do.	2.00 do. do.
100 to 150	do.	3.00 do. do.

N. B.—To avoid trouble please give name of Vise, number, weight and width of jaw desired.

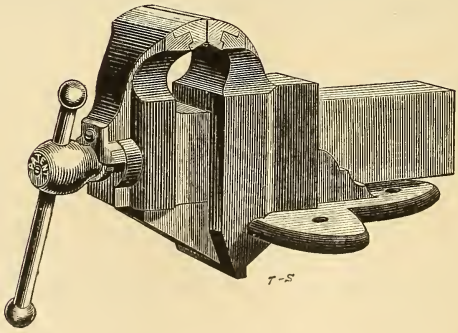
VISES—Continued.



PARKER'S PATENT PARALLEL.

Filer's Vise, - - - - - - $7.50 each.

Weight, 30½ lbs.; length of jaws, 4 inches.



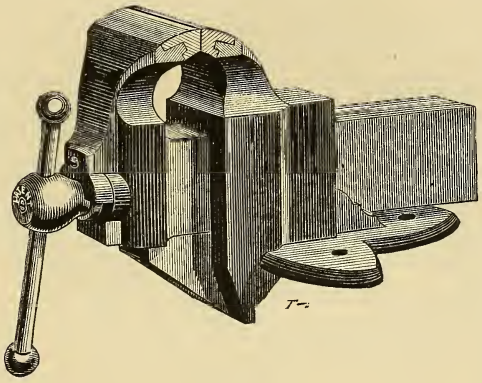
No. 000.

No. 000—Round Jaws, - - - $6.25 each.

Weight, 23 lbs.; length of jaws, 3⅛ inches.

VISES — Continued.

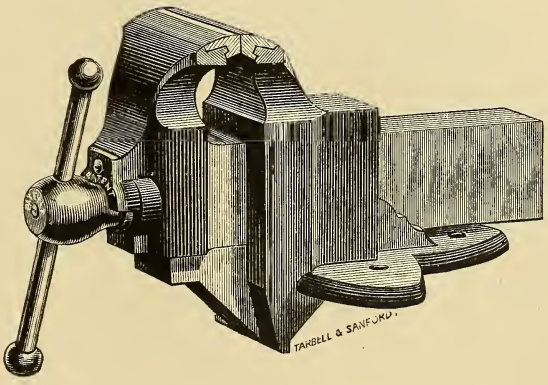
PARKER'S PATENT PARALLEL — Continued.



No. 1.

No. 1—Round Jaws, - - - - $7.25 each.

Weight, 31½ lbs.; length of jaws, 3⅝ inches.



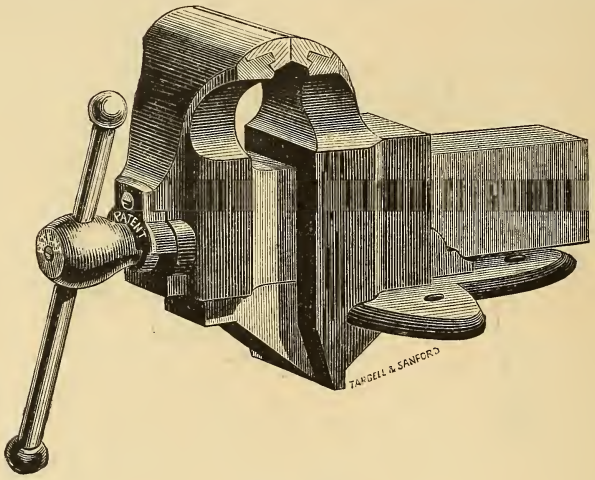
No. 2.

No. 2—Round Jaws, - - - - - $9.50 each.

Weight, 41½ lbs.; length of jaws, 4¼ inches.

VISES — Continued.

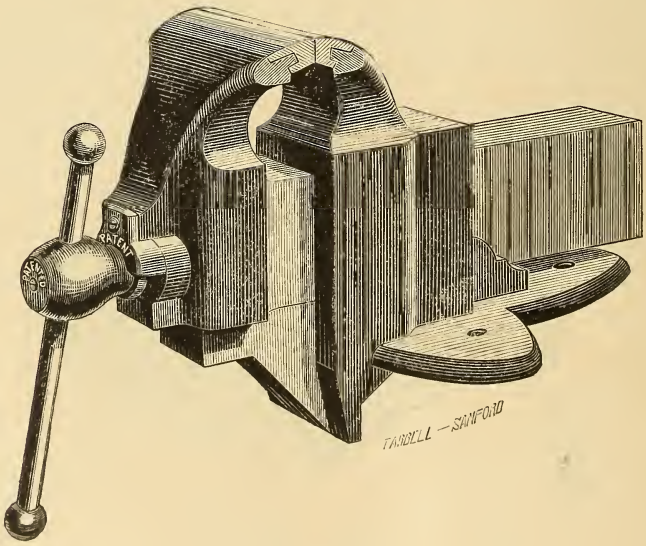
PARKER'S PATENT PARALLEL — Continued.



No. 3.

No. 3—Round Jaws, - - - - - $12.25 each.

Weight, 59½ lbs.; length of jaws, 4¾ inches.



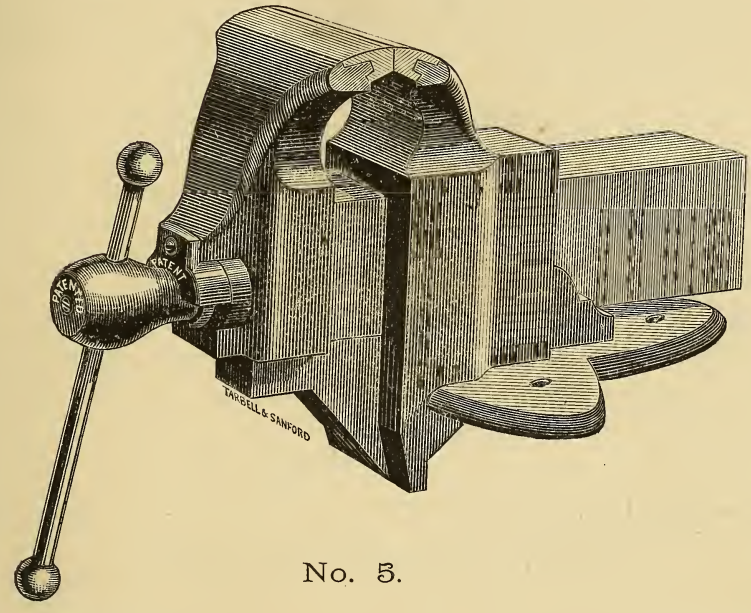
No. 4.

No. 4—Round Jaws, - - - - - $17.00 each.

Weight, 83 lbs.; length of jaws, 5¼ inches.

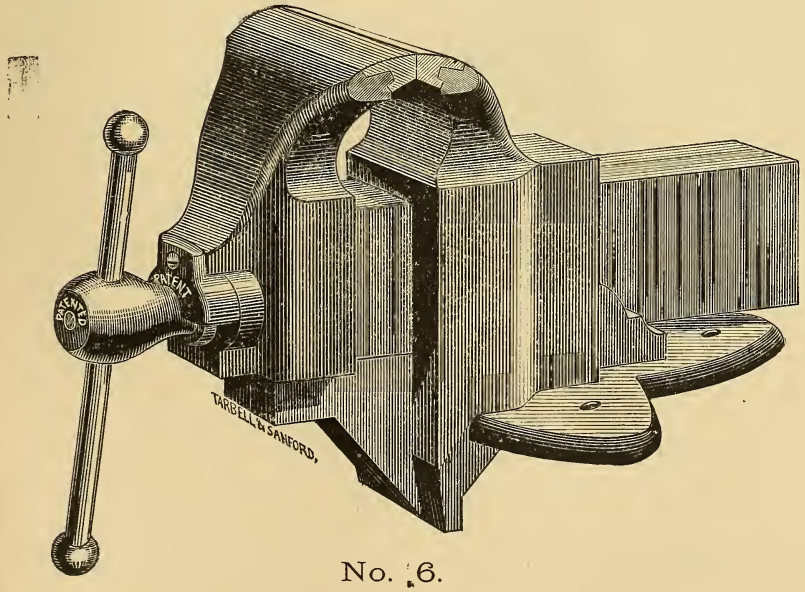
VISES—Continued.

PARKER'S PATENT PARALLEL—Continued.



No. 5.

No. 5—Round Jaws, - - - - - $25.00 each.
Weight, 120 lbs.; length of jaws, 5½ inches.

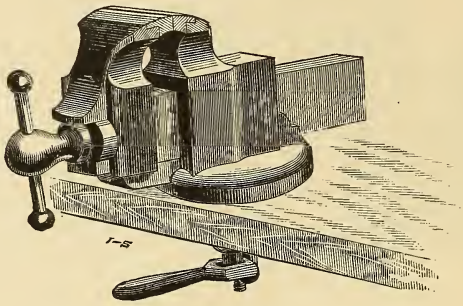


No. 6.

No. 6—Round Jaws, - - - - - $ each.
Weight, lbs.; length of jaws, 6 inches.

VISES—Continued.

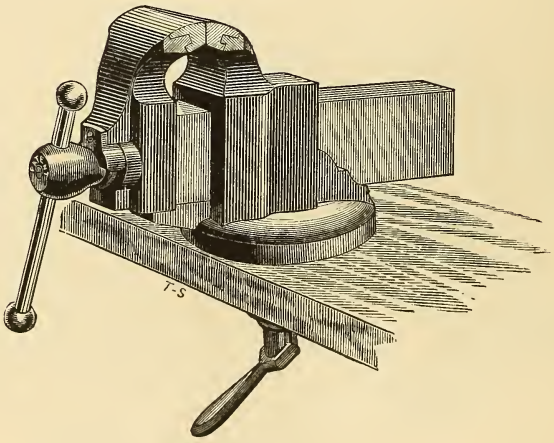
PARKER'S PATENT PARALLEL SWIVEL.



No. 0.

No. 0—Round Jaws Swivel, - - - - $5.00 each.

Weight, 8½ lbs.; length of jaws, 2¼ inches.



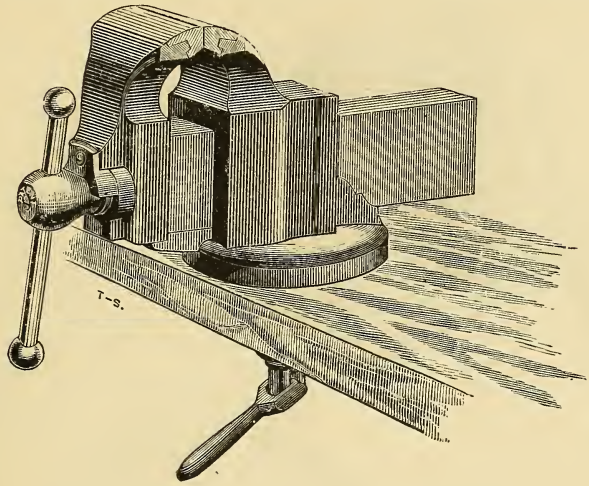
No. 00.

No. 00—Round Jaws Swivel, - - - - $7.25 each.

Weight, 23 lbs.; length of jaws, 3⅛ inches.

VISES—Continued.

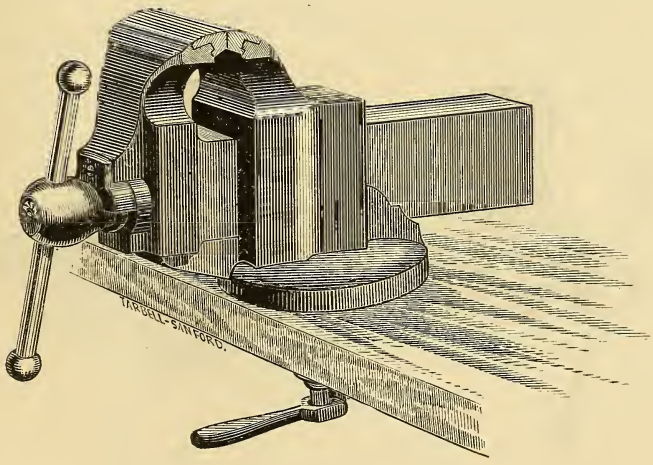
PARKER'S PATENT PARALLEL SWIVEL—Continued.



No. 1.

No. 1—Round Jaws Swivel, - - - - $9.00 each.

Weight, 35 lbs.; length of jaws, $3\frac{5}{8}$ inches.



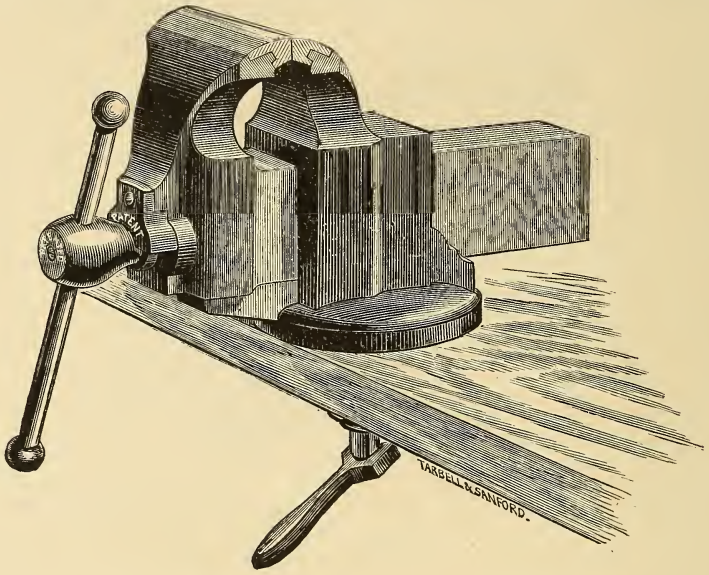
No. 2.

No. 2—Round Jaws Swivel, - - - - $11.25 each.

Weight, 48 lbs.; length of jaws, $4\frac{1}{4}$ inches.

VISES—Continued.

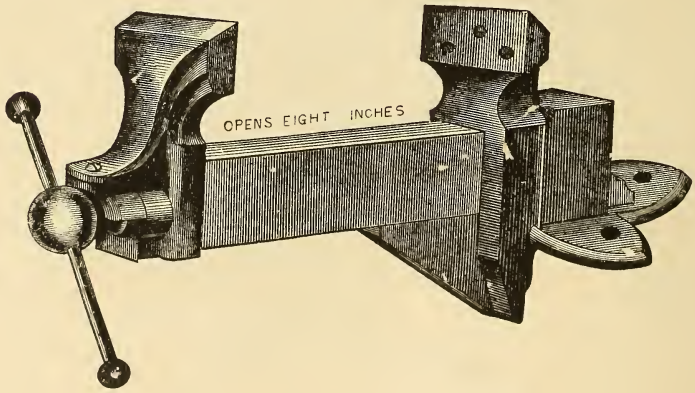
PARKER'S PATENT PARALLEL SWIVEL—Continued.



No. 3.

No. 3—Round Jaws Swivel, - - - - $15.00 each.

Weight, 63½ lbs.; length of jaws, 4¾ inches.



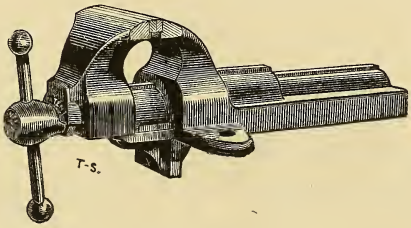
WOOD-WORKERS'.

Opens 8 inches, - - - - - $11.25 each.

Designed expressly for carriage makers and wood workmen; the jaws being sharp enable the workman to use the shave conveniently.

VISES—Continued.

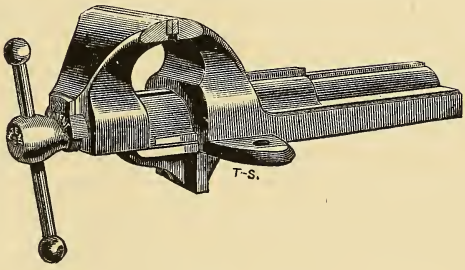
PARKER'S PATENT OVAL SLIDE.



No. 00.

No. 00—2½ in. Jaws, - - - - - $2.50 each.

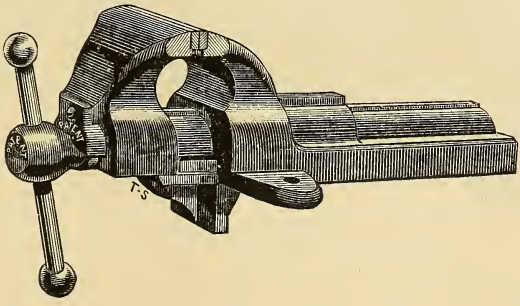
Weight, — lbs.



No. 0.

No. 0—3 in. Jaws, - - - - - $3.00 each.

Weight, 13 lbs.



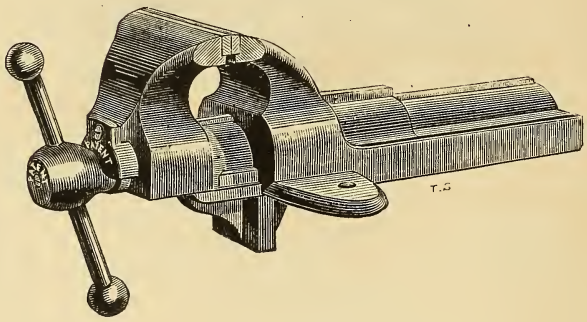
No. 1.

No. 1—3¼ in. Jaws, - - - - - $3.75 each.

Weight, 19 lbs.

VISES — Continued.

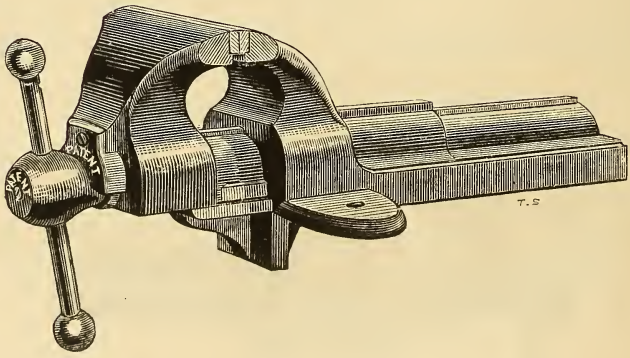
PARKER'S PATENT OVAL SLIDE — Continued.



No. 2.

No. 2—3½ in. Jaws, - - - - - $5.00 each.

Weight, 22 lbs.



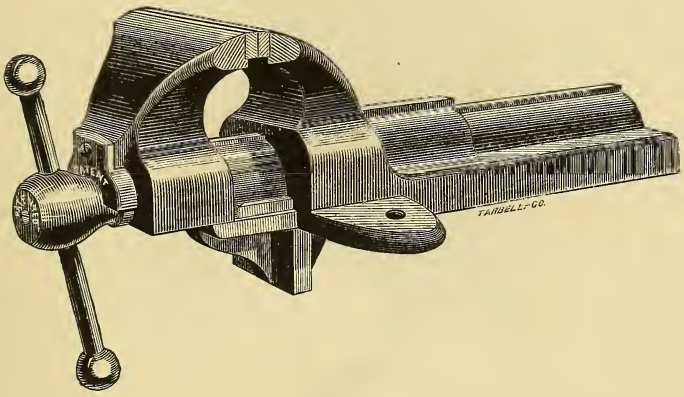
No. 3.

No. 3—4 in. Jaws, - - - - - $7.00 each.

Weight, 24 lbs.

VISES — Continued.

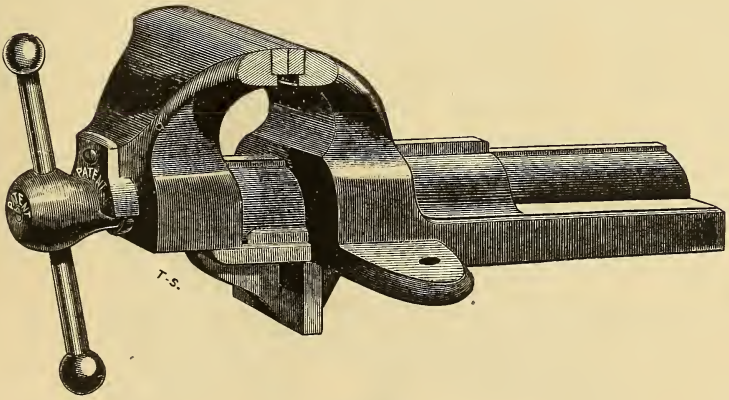
PARKER'S PATENT OVAL SLIDE — Continued.



No. 4.

No. 4—4½ in. Jaws, - - - - - $10.00 each.

Weight, 34 lbs.



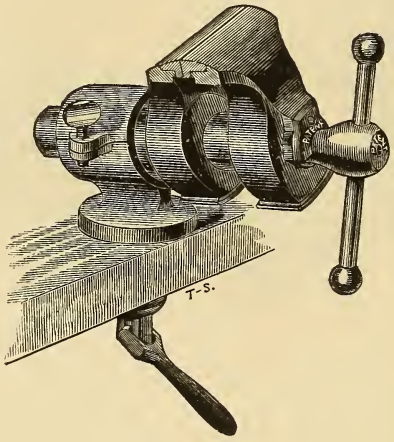
No. 5.

No. 5—5 in. Jaws, - - - - - $ each.

Weight, 60 lbs.

VISES — Continued.

PARKER'S PATENT ROUND SLIDE — Double Swivel.

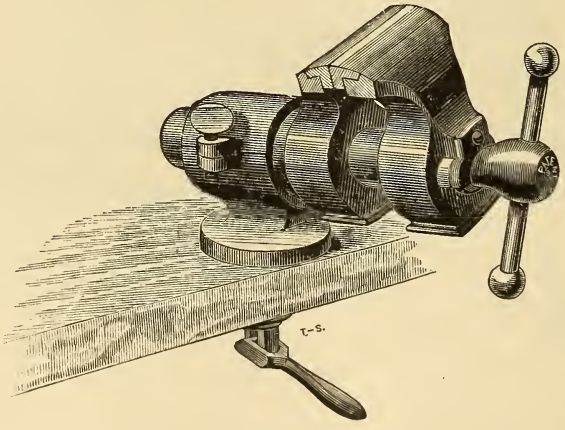


No. 10.

No. 10—Round Slide, 2¼ in. Jaws, - - - $5.75 each.

Weight, 8 lbs.

This vise is very desirable for machinists' use, as it can be swiveled on the bench, and the jaws brought to any angle desired by means of a set screw on the side of the cylinder or barrel of the vise.



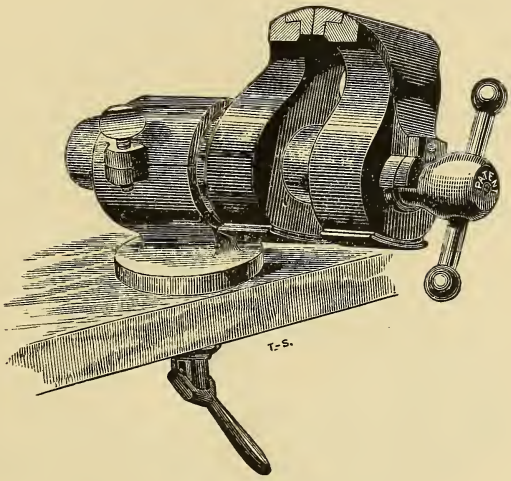
No. 11.

No. 11—Round Slide, 3⅛ in. Jaws, - - - $8.50 each.

Weight, 24 lbs.

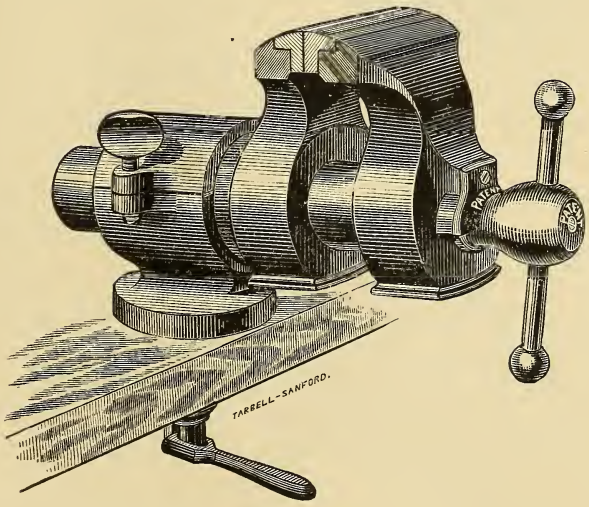
VISES — Continued.

PARKER'S PATENT ROUND SLIDE—Continued.



No. 12.

No. 12—Round Slide, $3\frac{5}{8}$ in. Jaws, - - - $10.25 each.
Weight, 33 lbs.

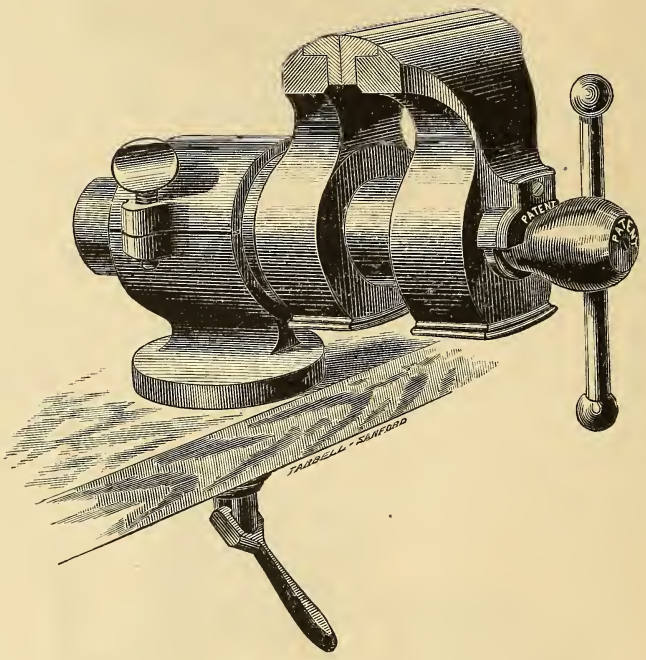


No. 13.

No. 13—Round Slide, $4\frac{1}{8}$ in. Jaws, - - - $ each.
Weight, 54 lbs.

VISES — Continued.

PARKER'S PATENT ROUND SLIDE — Continued



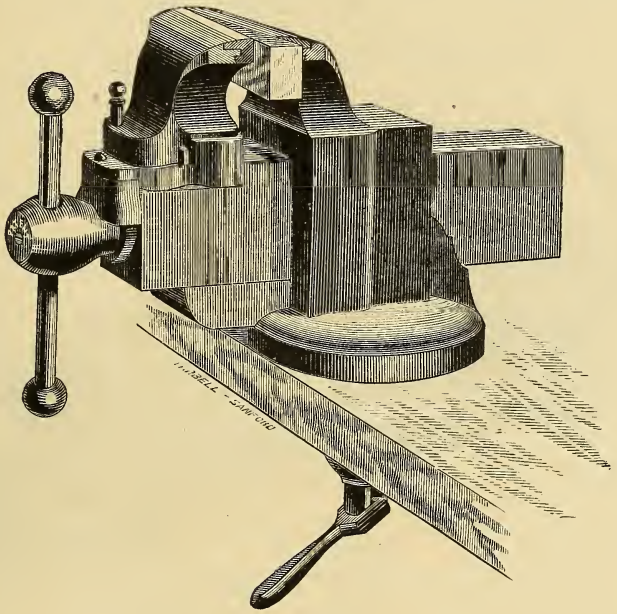
No. 14.

No. 14—Round Slide, $4\frac{3}{4}$ in. Jaws, - - $ each.

Weight, lbs.

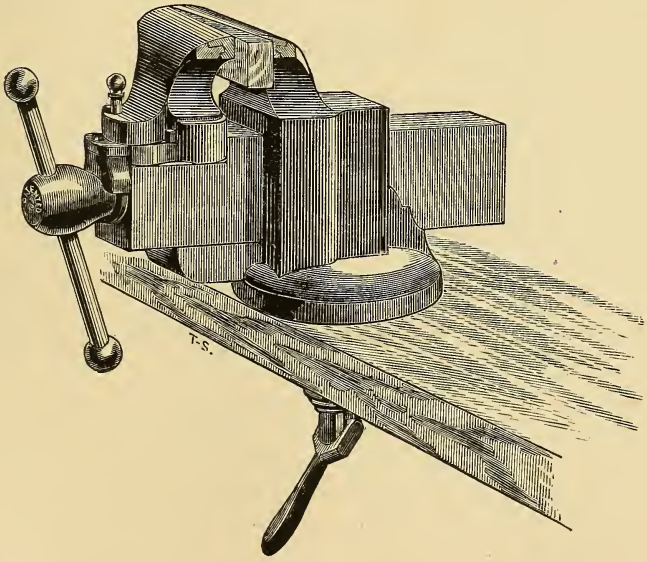
VISES — Continued.

HURLBERT'S PATENT SWIVEL JAW.



No. 2.

No. 2—$3\frac{5}{8}$ in. Jaws, weight, 46 lbs. - - $13.25 each.

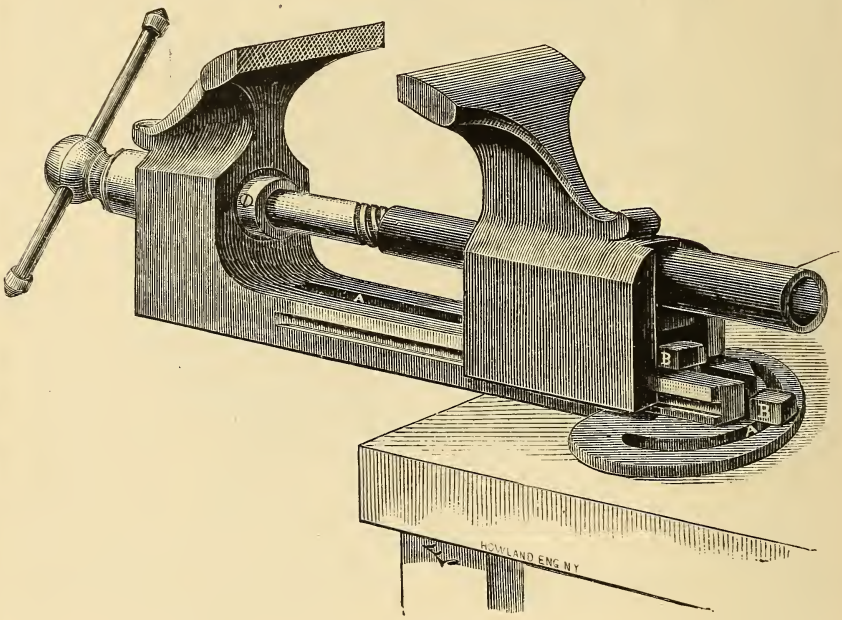


No. 3.

No. 3—$4\frac{1}{8}$ in. Jaws, weight, 62 lbs. - - - $16.25 each.

VISES — Continued.

I. C. TATE'S PATENT.



Wrought Iron.

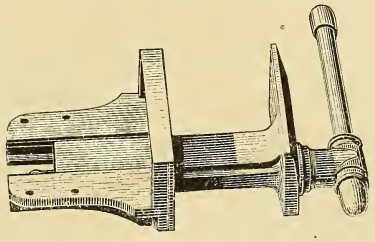
This vise can be used as a chuck on planers, lathes and upright drills. It has steel jaws. The outer jaw and bed-plate are solid. The inside jaw slides. The bed plate is formed on a half circle at the bench end. A slot (A) passes entirely through the centre of bed-plate and a half circle, through which two bolts (B) secure it to the bench.

When you wish to draw the vise out from the bench, you slack these bolts with the wrench (which goes with the vise), draw out until the inside bolt comes into the half circle slot, then turn the vise to any desired angle and screw the bolt home again.

No. 0—(No circle plate)	4	in. jaw,	5	in. opening,	-	-	$6.50
1	4½	do.	7	do.	-	-	8.25
2	5	do.	8	do.	-	-	14.00
3	6	do.	9	do.	-	-	25.00
4—Made to order.							

VISES — Continued.

I. C. TATE'S PATENT — Continued.

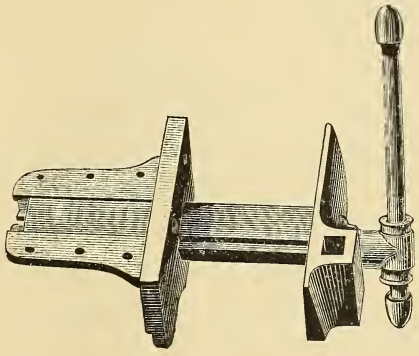


Iron Parallel Bench.

For carpenters' and other wood-workers' benches; wood handle; operates under the bench. This vise will hold firmly without bruising the work.

The stationary jaw fastens underneath, and to the bench; jaws flush with top of bench.

No. 2—	7½	in. jaw,	7	in. opening,	2¾	in. high above slide,	-	$3.00
3—	7½	do.	14	do.	2¾	do.	do.	- 5.25
4—11		do.	14	do.	2¾	do.	do.	- 9.50



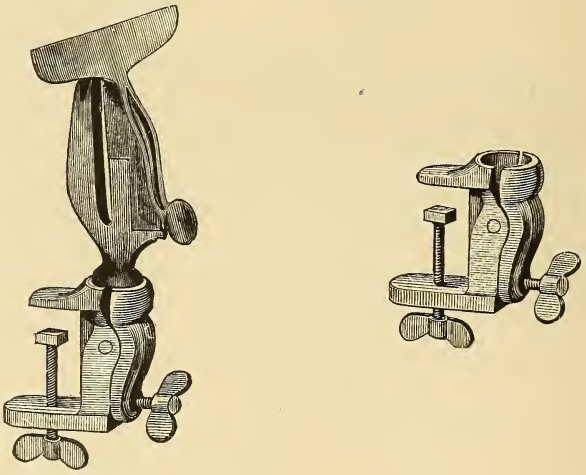
Iron Tail Screw.

For cabinet-makers' and carpenters' benches; wood handle; operates under the bench. This vise has a hole in the movable jaw for a dog one inch square. The stationary jaw fastens underneath, and to the bench, by wood screws or bolts; jaws flush with top of bench. Can be used as a clamp for doors and windows.

No. 1—10 in. jaw, 10 in. opening, 2½ in. high above slide, - $5.25

VISES — Continued.

I. C. TATE'S PATENT — Continued.



Saw Filer's Clamp, Universal Joint.

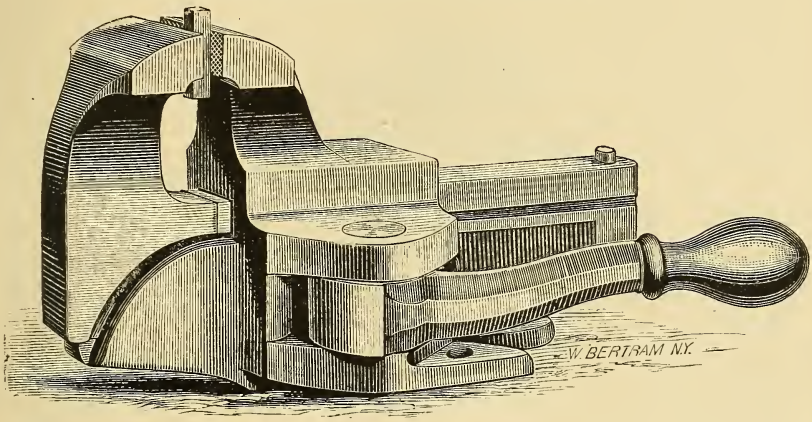
By means of the universal joint, the saw teeth may be turned to the light; this cannot be done in any ordinary vise.

The clamp jaws are carefully fitted and finished, and will hold the narrowest back saw or the widest hand saw. The clamp which holds the saw operates independently of the universal joint.

No. 1—10 in. jaw, 7 in. deep, - - - $14.00 per doz.

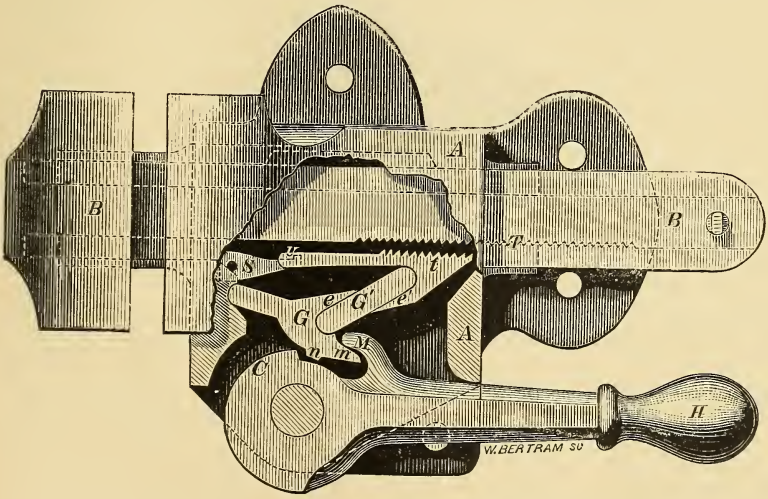
VISES — Continued.

STEPHENS' PATENT.



2	in. Jaws, weight	2 lbs.	- - - -	$4.00 each.
2¾	do.	do. 12 do.	- - - - -	6.00 do.
3½	do.	do. 35 do.	- - - -	10.00 do.
4½	do.	do. 65 do.	- - - - -	14.00 do.
6½	do.	do. 160 do.	- - - -	30.00 do.

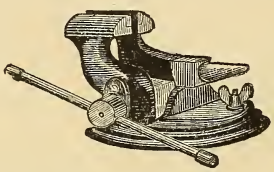
These vises are adapted to the lightest as well as the heaviest work, varying in weight from two to two hundred pounds.



The above sectional view shows the working parts of this vise, which consist simply of a short rack-bar and a toggle or knee-joint, worked by a cam, and raised from the long rack in the sliding-bar by means of a hook on the back of the handle.

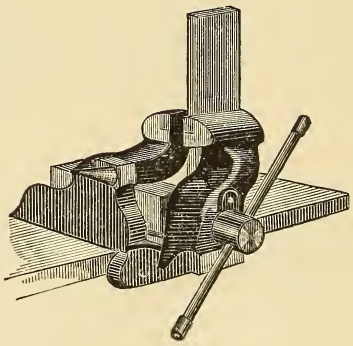
VISES—Continued.

HOAR'S PATENT.



Entire Rotary Vise.

No. 40—	1½	in. jaw,	rotary;	weight,	5	lbs.	-	-	$4.00 each.
41—	1¾	do.	do.	do.	8	do.	-	-	5.00 do.
42—	2	do.	do.	do.	12	do.	-	-	6.00 do.
43—	2½	do.	do.	do.	20	do.	-	-	7.00 do.
44—	3	do.	do.	do.	32	do.	-	-	8.50 do.
45—	3½	do.	do.	do.	53	do.	-	-	10.00 do.
46—	4	do.	do.	do.	65	do.	-	-	12.00 do.
47—	4½	do.	do.	do.	87	do.	-	-	15.00 do.
48—	5	do.	do.	do.	120	do.	-	-	20.00 do.

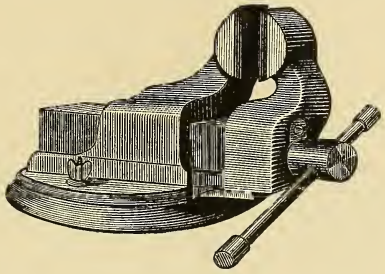


Stationary Vise.

No. 50—	1½	in. jaw,	stationary,	for fancy work;	weight,	4	lbs.	$3.00 each.
51—	2	do.	do.	do.	do.	10	do.	4.00 do.
52—	2½	do.	do.	do.	do.	15	do.	5.00 do.
53—	3	do.	do.	for machine work,	do.	25	do.	6.25 do.
54—	3½	do.	do.	do.	do.	40	do.	8.50 do.
55—	4	do.	do.	do.	do.	55	do.	10.00 do.
56—	4½	do.	do.	do.	do.	65	do.	12.00 do.
57—	5	do.	do.	do.	do.	90	do.	16.00 do.
58—	6	do.	do.	do.	do.	150	do.	25.00 do.
59—	7	do.	do.	for railroad work,	do.	250	do.	35.00 do.

VISES—Continued.

HOAR'S PATENT—Continued.



Coachmakers' Vise.

No. 61—3	in. jaw,	rotary—coachmakers';		weight,	32 lbs.	$8.50	each.
63—4	do.	do.	do.	do.	65 do.	12.00	do.
65—5	do.	do.	do.	do.	85 do.	15.00	do.
67—3	do.	stationary, left hand,		do.	25 do.	6.25	do.
68—4	do.	do.	do.	do.	55 do.	10.00	do.
69—5	do.	do.	do.	do.	90 do.	16.00	do.
70—7	do.	pipers', for heavy work,		do.	350 do.	55.00	do.
71—5	do.	do.	do.	do.	105 do.	18.00	do.
81—3½	do.	filers',	- -	do.	40 do.	8.50	do.
87—4	do.	parallel,	-	do.	42 do.	9.50	do.
88—4½	do.	do.	- -	do.	58 do.	11.00	do.

Nos. 40, 41, 50, 51, 67, 68—jaws to the left, with beak horn and anvil.

Nos. 42, 43, 44, 45, 46, 47, 52, 53, 54, 55, 56, 81—jaws to the right, with beak horn and anvil.

Nos. 47, 57, 58, 59, 61, 63, 65, 70, 71—jaws to the right.

No. 69—jaws to the left.

Nos. 87, 88—parallel jaws.

The jaws are available for all kinds of work, being off-set either to the right or left of shank screw. They are a top attachment, and can be secured to any level surface.

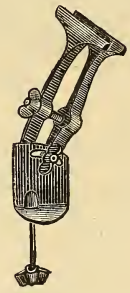
For holding work on planers or upright drills, they have no equal.

The swivel vise is rotated simply by turning two set screws on either side of beam, as shown in cut.

These vises are made of the best gun metal. Every vise warranted. The steel jaws are secured by machine screws, and easily replaced in case of accident.

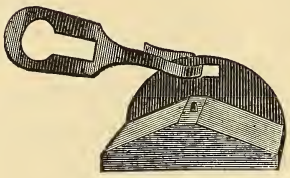
VISES — Continued.

HOAR'S PATENT — Continued.



Saw Filers'.

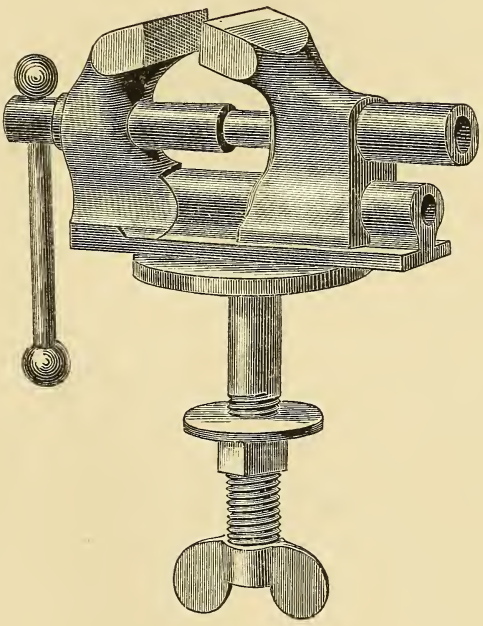
10 inch jaws, - - - - -	$16.50 per doz.



Bevel Jaw Attachment for Hoar's Patent.

1½ inch, - -	25 cents.	4 inch, - -	75 cents.
2 do. - -	33 do.	5 do. - -	1.00 do.
2½ do. - -	42 do.	6 do. - -	1.25 do.
3 do. - -	50 do.	7 do. - -	1.50 do.
3½ do. - -	62 do.		

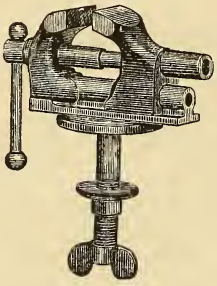
VISES — Continued.



BACKUS' PATENT.

1¾	in. jaw,	-	without iron seat,	$3.50;	with iron seat,	$4.00		
2½	do.	-	do.	do.	5.75;	do.	do.	6.50
3	do.	-	do.	do.	7.50;	do.	do.	8.50
3½	do.	-	do.	do.	9.50;	do.	do.	10.50
4	do.	-	do.	do.	10.75;	do.	do.	12.00
4½	do.	-	do.	do.	13.00;	do.	do.	14.50
5	do.	-	do.	do.	17.25;	do.	do.	19.00
5½	do.	-	do.	do.	19.00;	do.	do.	21.00
6	do.	-	do.	do.	24.00;	do.	do.	26.00

VISES — Continued.



BACKUS' PATENT — Continued.

This vise is constructed with a view of combining all the good qualities of the different vises now in use, with the peculiar advantages secured by the patents. It is better made than any other vise, and more easily adapted to different kinds of work. It is stronger—the screw passing through the centre instead of the bottom—and the screw is entirely protected by a telescopic covering, which is the only means by which the screw can be covered without weakening the vise, and still have the screw pass through the centre. This vise rests on a circular plate or seat of iron, having a hollow projection or hub long enough to reach through the bench, with a nut under the bench. The vise is secured on this plate or seat by a bolt having a square head fitting into a slot in the under side of the vise, and passing through the plate or hub, with a hand nut on the lower end, which screws up firmly against the end of the hub. By loosening this nut, the vise may be turned on the seat to any desired angle, or may be moved forward or backward to accommodate the workman. By drawing the vise forward to a certain point, the head of the bolt will slip out of the slot, and the vise may be removed from the bench to be used for holding the work on a planer, upright drill, or other machine; and it can be almost instantly restored to its place on the bench. The vise is also furnished without the iron plate or seat, in which case it rests immediately on the bench, and is fastened by the bolt with the hand nut under the bench. The jaws are faced with hardened steel welded to the iron.

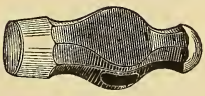
HAMMERS.

CROSS PANE, No. 49.

Moss & Gamble's (English)—Solid cast steel, - - per lb.
American, do. do. - do.

STRAIGHT PANE, No. 50.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

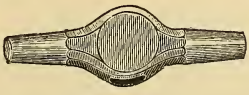


BALL PANE, No. 53.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

FLOGGING, No. 60.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



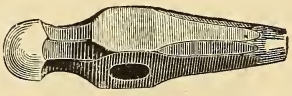
RIVETING, No. 56.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

HAMMERS—Continued.

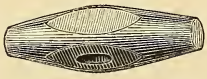
RIVETING, No. 57.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



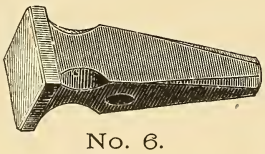
RIVETING, No. 58.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

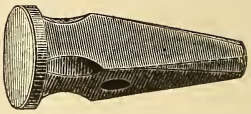


RIVETING, No. 0.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



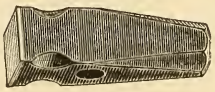
No. 6.



No. 7.

FLATTERS.

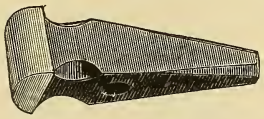
Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



SET HAMMER, No. 5.

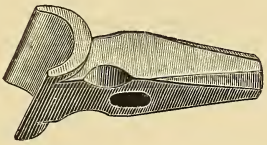
Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

HAMMERS—Continued.



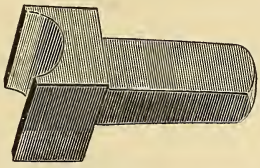
FULLER, No. 4.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



TOP SWAGE, No. 1.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.



BOTTOM SWAGE, No. 8.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

CUPPING TOOL, No. 3.

Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

CUPPING TOOL, No. 2.

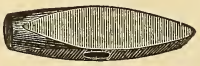
Moss & Gamble's, solid cast steel, - - - per lb.
American, do. do. - - - do.

HAMMERS — Continued.

BLACKSMITHS'.

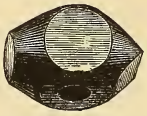
HAND.

Solid cast steel, all polished, - - - - per lb.



RIVETING.

Solid cast steel, - - - - - - per lb.

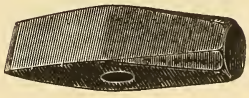


TURNING.

Solid cast steel, - - - - - - each.

CREASING.

Solid cast steel, - - - - - - per lb.



COLD CUTTING.

Solid cast steel, - - - - - - per lb.

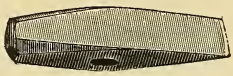
HOT CUTTING.

Solid cast steel, - - - - - - per lb.

HAMMERS — Continued.

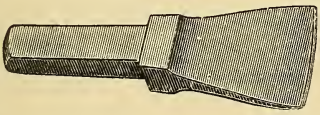
TRACK PUNCH.

Solid cast steel, - - - - - - per ℔.



TRACK CHISEL.

Solid cast steel, - - - - - - per ℔.



HARDIES.

Solid cast steel, - - - - - - per ℔.

CHISEL.

Solid cast steel, - - - - - - per ℔.

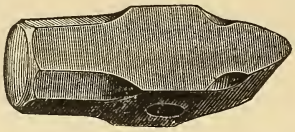
DRILLING.

Cast steel, face and pane, - - - - per ℔.
do. solid, - - - - - do.

NAPPING.

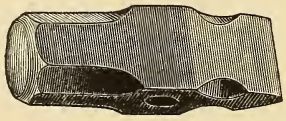
Cast steel, face and pane, - - - - per ℔.
do. solid, - - - - - do.

HAMMERS—Continued.



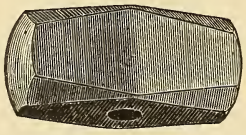
CROSS PANE SLEDGE.

Cast steel, face and pane, - - - - per lb.
do. solid, - - - - do.



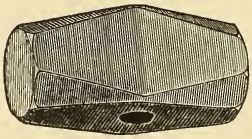
STRAIGHT PANE SLEDGE.

Cast steel, face and pane, - - - - per lb.
do. solid, - - - - do.



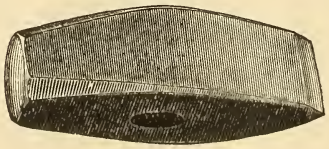
TURNING SLEDGE.

Cast steel, face and pane, - - - - per lb.
do. solid, - - - - do.



STRIKING SLEDGE.

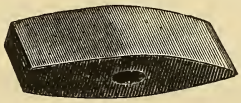
Cast steel, face and pane, - - - per lb.
do. solid, - - - - do.



MASONS' SLEDGE.

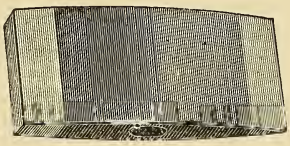
Cast steel, face and pane, - - - - per lb.
do. solid, - - - - do.

HAMMERS — Continued.



CHIPPING.

Cast steel, face and pane, - - - - per lb.
do. solid, - - - - - do.



HAND.

Cast steel, face and pane, - - - - per lb.
do. solid, - - - - - do.

BOAT SPIKE MAUL.

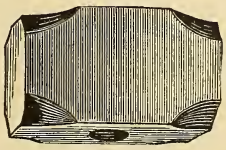
Cast steel, any size, - - - - - per lb.

COAL MAUL.

Cast steel, any size, - - - - - per lb.

RAILROAD SPIKE MAUL.

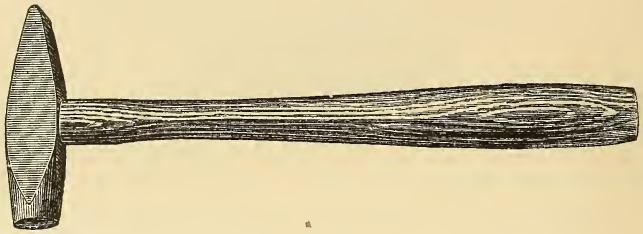
Cast steel, any size, - - - - - per lb.



POST MAUL.

Cast iron, - - - - - - per lb.

HAMMERS — Continued.



RIVETING — With Handles.

No. 1	Riveting,	- - - - -	$4.50	per doz.
2	do.	0 lb. 12 oz. - - - -	5.25	do.
3	do.	1 lb. 0 oz. - - -	6.00	do.
4	do.	1 lb. 3 oz. . - - -	7.00	do.
5	do.	1 lb. 7 oz. - - -	9.00	do.
6	do.	1 lb. 11 oz. - - - -	10.50	do.
7	do.	2 lbs. 0 oz. - - -	12.00	do.

TONGS.

All sizes, - - - - - - per lb.

HEADING TOOLS.

All sizes, - - - - - - per lb.

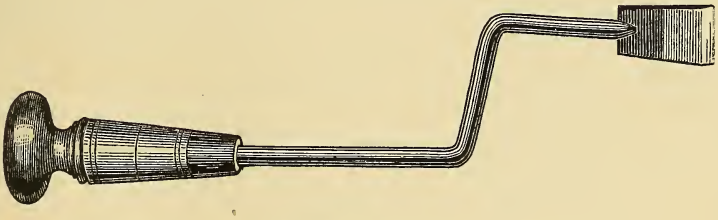
FARRIER'S TOOLS.

HAMMER — With Handle.

Adze Eye, Octagon Poll, weighing 10 oz. - - $7.50 per doz.
do. Round do. do. do. - - 7.50 do.

KNIFE.

Wostenholm's (English), IXL - - - per doz.



BUTTRESS.

Best quality, - - - - - - per doz.

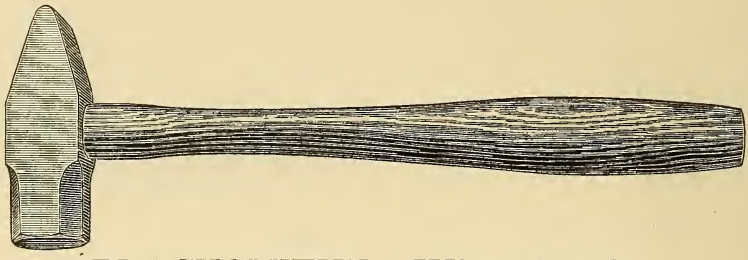
PINCHERS.

Cast steel jaws, - - - - - per doz.

PRITCHEL.

Solid cast steel, - - - - - - per ℔.

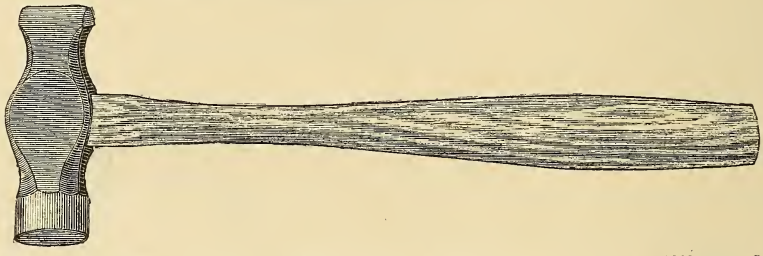
HAMMERS—Continued.



BLACKSMITH'S—With Handles.

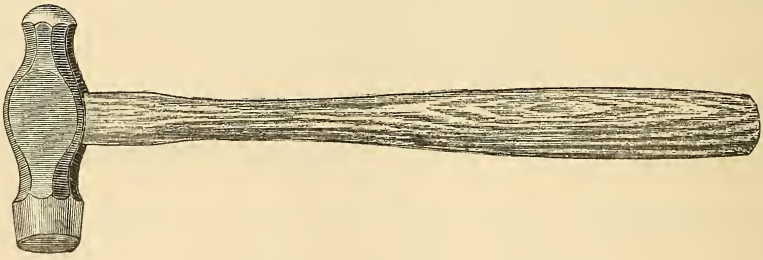
No. 1	Cross Pane,	2 lbs. 4 oz.	$12.25 per doz.
2	do.	2 lbs. 11 oz.	15.75 do.
3	do.	3 lbs. 9 oz.	18.75 do.
4	do.	4 lbs. 0 oz.	21.50 do.

Double face, same price as above.



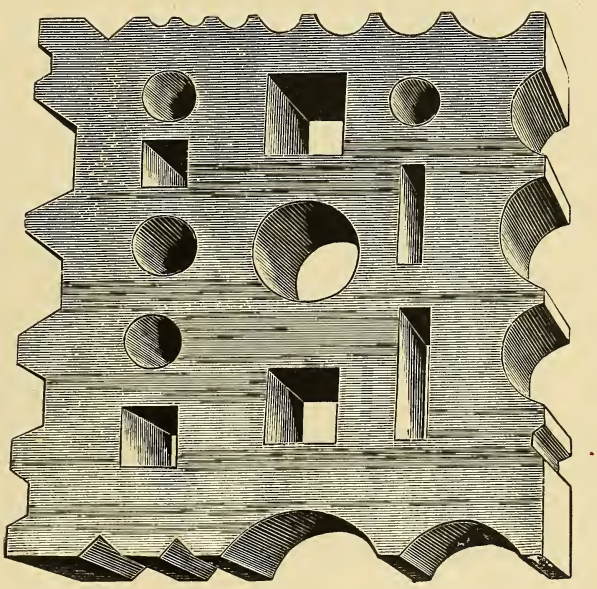
STRAIGHT AND CROSS PANE—With Handles.

No. 0	Straight and Cross Pane,	1 lb. 5 oz.	$13.00 per doz.
1	do.	do. 2 lbs. 0 oz.	17.25 do.
2	do.	do. 2 lbs. 7 oz.	21.50 do.
3	do.	do. 3 lbs. 1 oz.	25.75 do.
4	do.	do. 3 lbs. 7 oz.	30.00 do.



BALL PANE—With Handles.

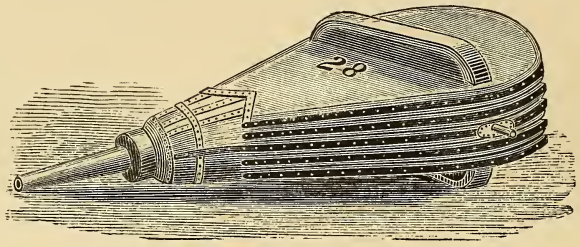
No. 0	Ball Pane,	1 lb. 3 oz.	$13.00 per doz.
1	do.	1 lb. 13 oz.	17.25 do.
2	do.	2 lbs. 7 oz.	21.50 do.
3	do.	3 lbs. 0 oz.	25.75 do.
4	do.	3 lbs. 5 oz.	30.00 do.



SWAGE BLOCK.

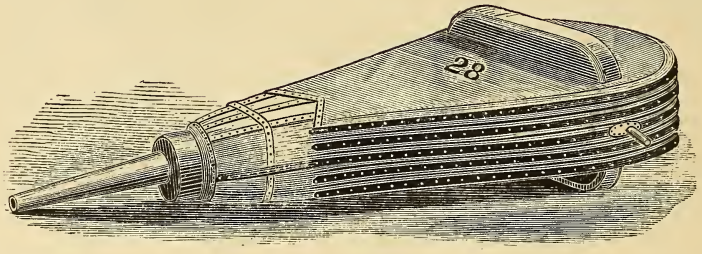
Swage Block, - - - - - - per lb.

BELLOWS.



ORDINARY PATTERN.

24 inch,	$ 8.00	each.
26 do.	9.00	do.
28 do.	10.50	do.
30 do.	12.00	do.
32 do.	13.50	do.
34 do.	15.00	do.
36 do.	16.50	do.
38 do.	19.00	do.
40 do.	22.00	do.

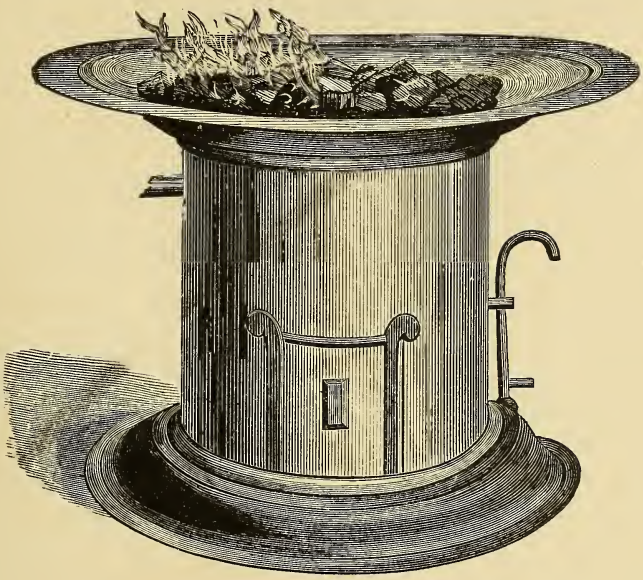


LONG PATTERN.

24 inch,	$12.50	each.
26 do.	13.50	do.
28 do.	14.50	do.
30 do.	16.00	do.
32 do.	17.50	do.
34 do.	19.00	do.
36 do.	20.50	do.
38 do.	23.00	do.
40 do.	26.00	do.
42 do.	30.00	do.
44 do.	35.00	do.
46 do.	40.00	do.
48 do.	45.00	do.
50 do.	50.50	do.

FORGES.

BLACKSMITH'S.



PATTERSON'S PATENT.

Perforated Conical Tuyer, adapted to all Branches of Blacksmith's Work.

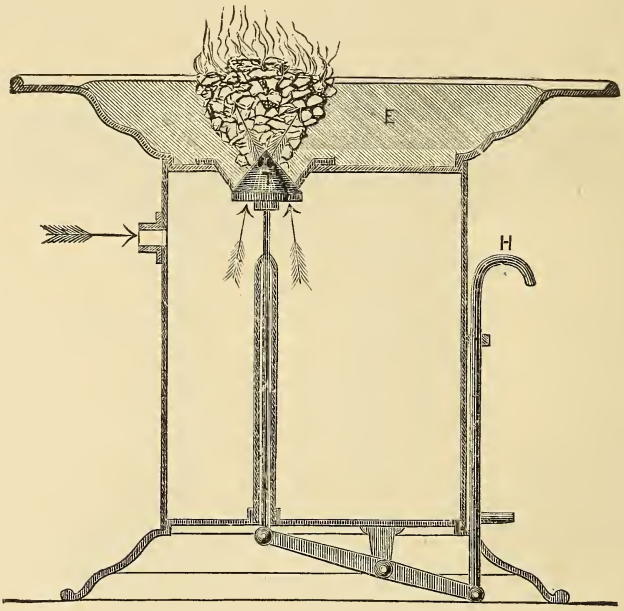
No. 1	—Boilermakers' Rivet-Fire, -	Weight,	60 lbs.	$13.00
2	—Tool Repairers' Fire for Machine Shop,	do.	150 do.	22.00
3	—Horse-Shoeing and Common Jobbing Fire,	do.	180 do.	29.00
4	—Carriage and Wagonmakers' Fire,	do.	250 do.	39.00
4½	—Large capacity for Common Machine Shop,	do.	400 do.	51.00
5	—Equals Locomotive-fire for Driving-wheels,	do.	500 do.	61.00
6	—New size for Railroad Shops, -	do.	775 do.	80.00

All interested in the working of Iron, in any of its branches, are especially invited to make an examination of the wonderful simplicity, neatness, compactness and durability of this forge, which must supersede all others in use, as soon as it becomes known.

Each forge is provided with two tuyers of different capacities, which may be changed in a minute. The tuyers are indestructible by fire, and will not choke up.

We are sole agents for the Northwest.

FORGES—Continued.



Sectional View of Patterson's Patent Forge and Flange.

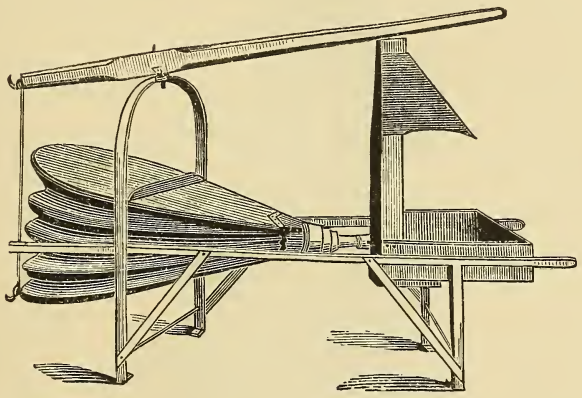
The cut on opposite page represents the exterior or elevation of the forge, with handle, door to reservoir, &c.

Above is a sectional view of the interior of the forge. E represents the earth on the table or top; T the conical perforated tuyer; H the handle for operating the tuyer in cleaning or dropping the ashes and cinders into the drum, which is done in an instant. The arrows indicate the wind-blast, from the bellows into the reservoir, which supplies the tuyer with a soft blast giving an intense and even heat.

The flanging plate shown (an extra) is for the purpose of making a line fire, or circular fire of any size, as indicated by the holes in the plate. For a line fire, close up all the other holes where a fire is not wanted, and same for a circular or any other shaped fire. This plate is used on forges 4½, 5 and 6. Must be specially ordered when wanted.

These forges are composed of a cast iron table and base, connected by a sheet iron body, and are exceedingly light and durable, weighing from 60 to 775 lbs., according to size, and are applicable to all blasts or bellows commonly used.

FORGES — Continued.



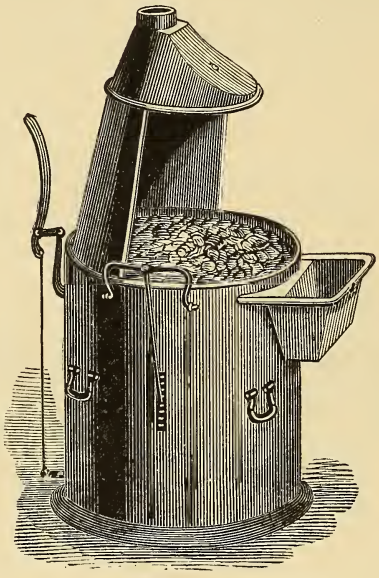
LONG PORTABLE FORGE — Iron Frame.

No. 0—24 inch	Bellows,	$41.00
1—26	do.	42.00
2—28	do.	44.00
3—30	do.	47.00

These forges have iron frames, with large capacity for heating, are compact and portable, and can be used for out-door work and with safety in-doors.

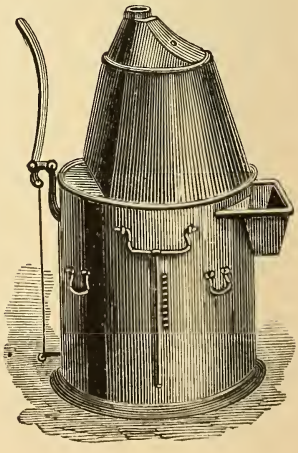
FORGES — Continued.

BLACKSMITH'S FORGE AND BELLOWS.



QUEEN'S PATENT.

For which we are Sole Agents in the Northwest.



FORGES — Continued.

QUEEN'S PATENT PORTABLE FORGE AND BELLOWS.

For Blacksmiths, Jewelers and Dentists.

These are considered by all who have given them a fair trial, the most compact and desirable portable forge made. They can be set where most convenient for room and light with perfect safety, as the smoke can be carried to the chimney by a common pipe.

Blacksmith's Forges.

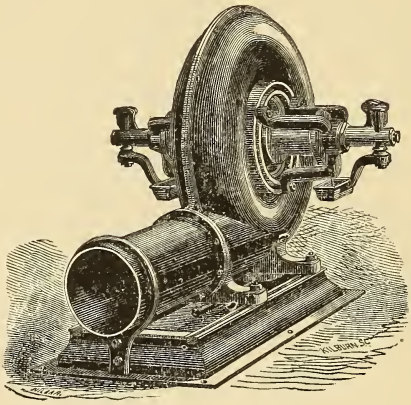
No. 0—	Weight,	105	lbs.;	diam.,	1 ft. 8 in.;	height,	3 ft.	10	in.	$26.00	each.
A—	do.	150	do.	do.	1 ft. 9 in.;	do.	3 ft.	11	in.	32.00	do.
1—	do.	215	do.	do.	2 ft.	do.	4 ft.	2	in.	42.00	do.
1½—	do.	260	do.	do.	2 ft. 3 in.;	do.	4 ft.	5	in.	51.00	do.
2—	do.	350	do.	do.	2 ft. 6 in.;	do.	4 ft.	8	in.	63.00	do.
3—	do.	450	do.	do.	3 ft.	do.	4 ft.	10	in.	78.00	do.

Jeweler's Forges.

No. 0—	Weight,	115	lbs.	-	-	$28.00	each.
A—	do.	155	do.	-	-	34.00	do.
1—	do.	245	do.	-	-	44.00	do.
1½—	do.	300	do.	-	-	54.00	do.
2—	do.	400	do.	-	-	65.00	do.

The No. 0 Forges are made without slides for closing, and without water troughs.

BLOWERS.



B. F. STURTEVANT'S PATENT IMPROVED PRESSURE BLOWER.

For Cupola Furnaces and Forges.

PRICE LIST, JANUARY 1, 1870.

Number or size of Blower.	Price of Blower, with Counter-shaft and Pulleys for two belts.	Price of Blower without Counter-shaft and Pulleys.	Diameter of Pulleys on Blower.	Diam. of driving Pul'ys for 2 belts.	Diameter of small Pulley on counter-shaft.
00	$27.50	$25.00	2	18	5
0	38.50	35.00	2¼	18	6
1	49.50	45.00	2½	21	7
2	71.50	65.00	3	24	8
3	99.00	90.00	3½	28	9
4	143.00	130.00	4	32	11
5	198.00	180.00	5	36	12
6	264.00	240.00	5¾	42	14
7	341.00	310.00	6¾	48	16
8	429.00	390.00	7¾	54	18
9	528.00	480.00	9	60	22
10	638.00	580.00	10½	66	24
11	748.00	680.00	12	72	30

When the speed and diameter of the main driving pulley will admit, it is desirable to increase the diameter of these small pulleys one size.

BLOWERS — Continued.

Table for Speed and Capacity of Sturtevant's Improved Fan Blower.

Number or Size of Blower.	Diameter in inches of Blast Wheel.	Number of Revolutions for Fair Blast.	No. of Revolutions for Strong Blast.	No. of Revolutions for very Powerful Blast.	No. of Forges for Rail-road and other Heavy Work.	Size of Boilers in Horse Power.
000	6¼	6100	Used for blow pipes, jewelry manufacturing and removing saw-dust, shavings, etc.			
00	8¼	4550	Used for blow pipes, various kinds of light work, and sometimes for small forges.		1	4
0	10¼	3550	Used for small forges and boilers, not adapted for heavy work.		2	8
1	12¼	2960	4450	May be used for Cupola Furnaces from 18 to 24 in. diameter inside of lining.	4	12
2	15½	2475	3725		6	20
3	18½	2075	3100		9	30
4	22	1725	2600	3450	12	60
5	26	1450	2175	2900	16	90
6	30½	1250	1875	2500	22	130
7	35½	1075	1600	2100	31	180
8	41	925	1375	1850	41	240
9	47	800	1200	1600	52	310
10	54	700	1050	1400	71	390
11	62	500	775	1025	93	480

Diameter of Pulley on Blower is two-sevenths diameter of Blast Wheel.

This speed is designed for the various purposes of ventilation, steam boilers, rolling mills, and where grate-bars are used instead of tuyers, and also where the purchaser is opposed to quick speed.

Warranted to run safely at this speed.

For small forges and heating furnaces, such as are used for bolt making and edge-tool manufacturing, each Blower above No. 2 will furnish blast for double the No.

Size of Blower is generally governed by number of horse-power of steam made.

The Pressure required for Cupola Furnaces of various sizes is,

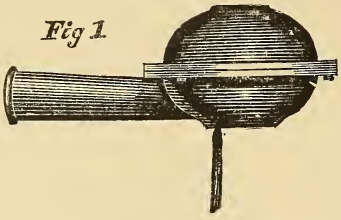
6 feet in diameter,	1½ lbs.	3½ feet in diameter,	0⅞ lbs.
5 " "	1¼ "	3 " "	0¾ "
4½ " "	1⅛ "	2½ " "	0⅝ "
4 " "	1 "	2 " "	0½ "

FORGES.—Very large forges require ⅝ lbs. pressure.
Medium and smaller ones, from ½ to ¼ lbs.

BOILERS.—The force or blast for burning coal-dust or screenings need not be more than ¼ lb. pressure per square inch, and where larger coal is used a much weaker blast will answer.

TUYER IRONS.

Fig 1.



MONITOR.

Price, - - - - - - - - $2.50 each.

Fig. 1 represents the Monitor complete, showing position of air valve when open.

Fig 2

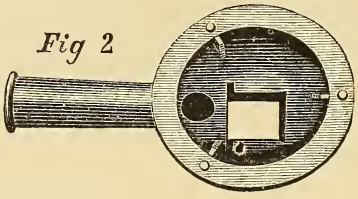


Fig. 2 represents the lower half of tuyer, showing opening for air valve and rests for gauge plate.

Fig 3

Fig. 3 represents the top cap with gauge-plate in position.

Fig 4

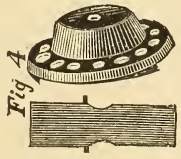
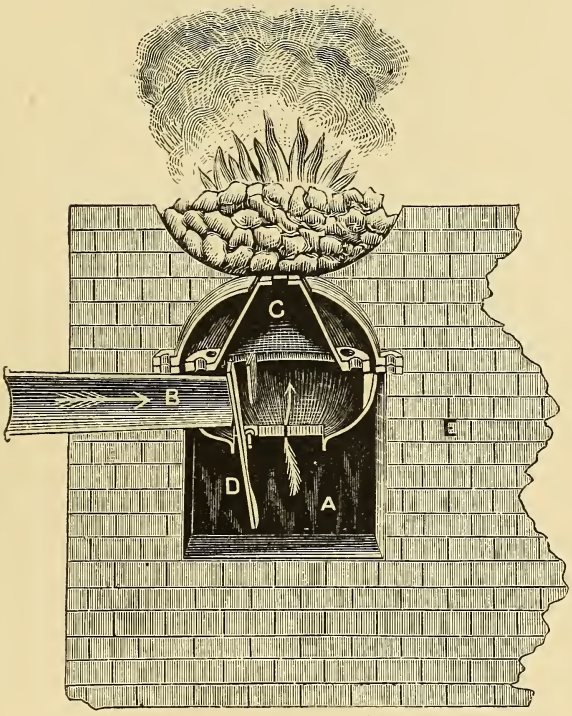


Fig. 4 represents the air valve; also the gauge-plate—showing the inclinations on edge of same which raise and lower it in top cap, thereby regulating the blast.

TUYER IRONS — Continued.



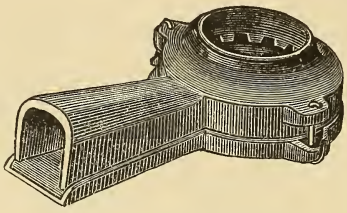
MONITOR — Continued.

This cut shows the setting in brick.

A, is a recess left in the brick-work, open to front of forge; B, air-pipe from bellows; C, gauge-plate to regulate blast; D, air-valve, which will close when the bellows or blast are applied; E, brick-work of forge.

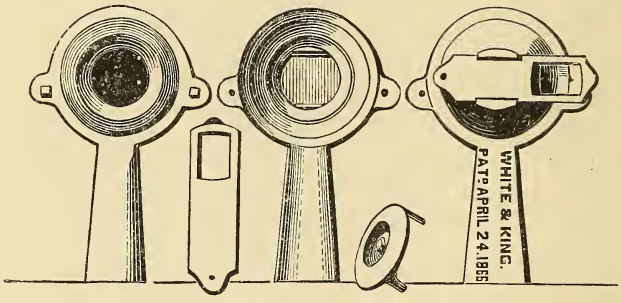
See directions for setting on each tuyer.

TUYER IRONS—Continued.



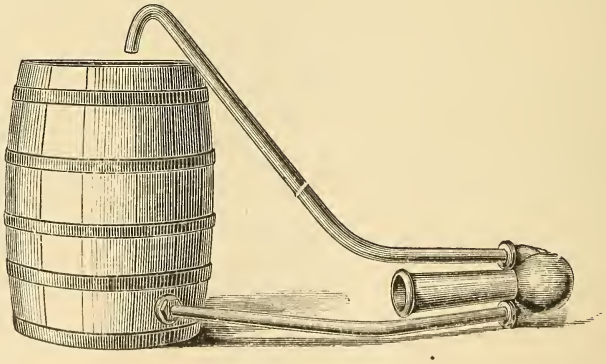
DUCK NEST.

Single, - - - - - - - $2.00 each.
Double, - - - - - - 2.50 do.



DUCK NEST WITH SLIDE.

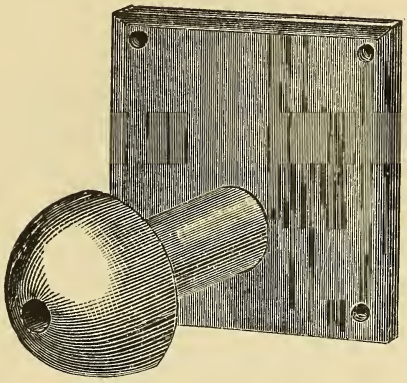
With Slide, - - - - - - $3.00 each.



DOLE'S PATENT WATER TUYER.

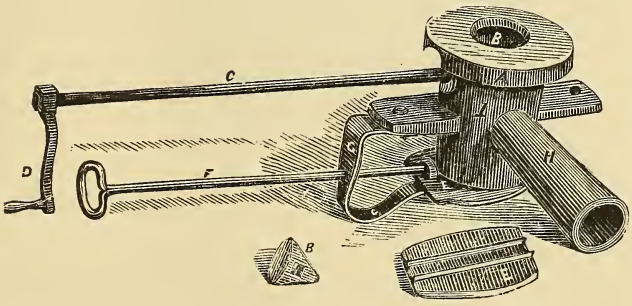
Dole's Patent, - - - - - - $7.00 each.

TUYER IRONS—Continued.



GLOBE HEAD.

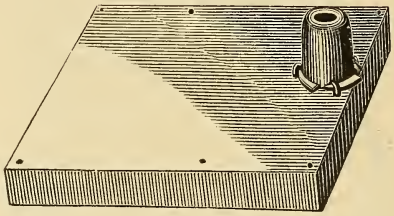
With plate, - - - - - - - $4.00 each.
Without plate, - - - - - - 2.00 do.



NORTON'S PATENT.

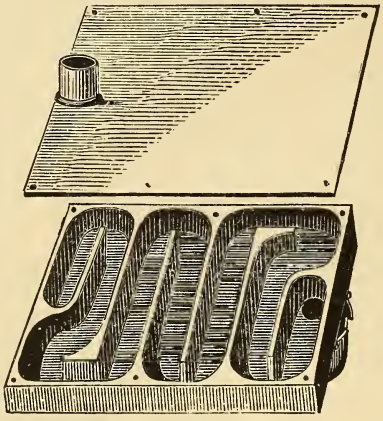
Norton's Patent, - - - - - $4.50 each.

TUYER IRONS—Continued.



SERPENTINE WIND WORM AND BACK PLATE COMBINED.

The above cut shows the tuyer complete.

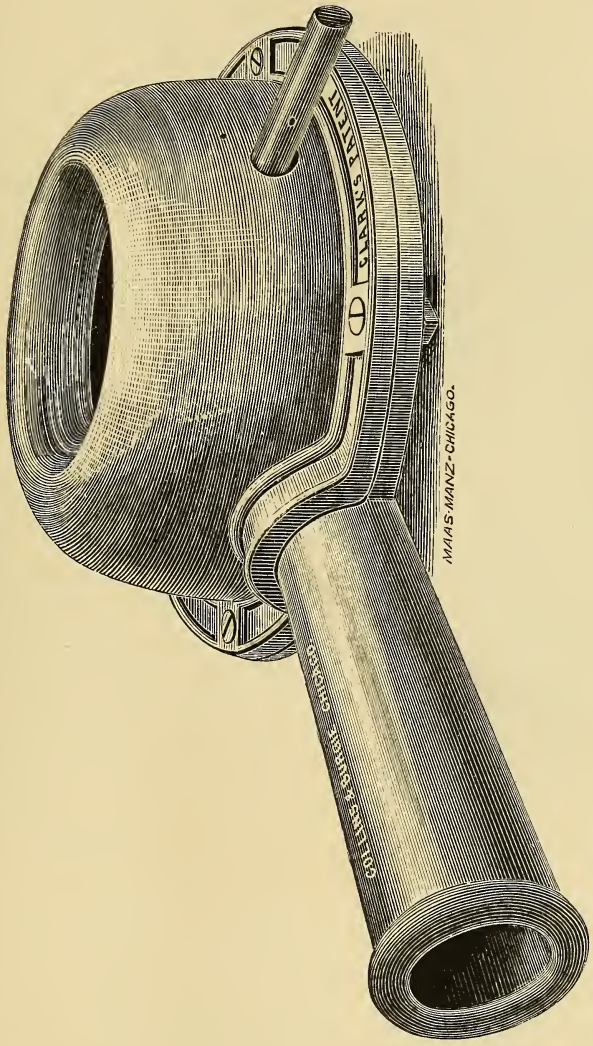


This cut gives a sectional view, showing course of blast, its entrance and escape.

It is a perfect preventive against explosion of bellows by gas from the forge, and produces an even, steady and prolonged blast.

Price, - - - - - - - $6.00 each.

TUYER IRONS—Continued.



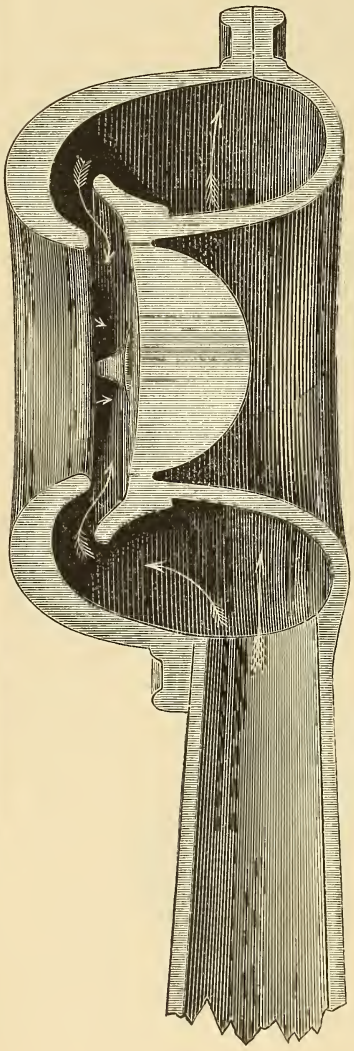
CLARK'S PATENT.

No. 1,	- - - - - -	$2.75 each.
2,	- - - - - - -	3.00 do.
3,	- - - - - - -	3.50 do.
4,	- - - - - - -	5.25 do.

(See pages 124, 125, 126.)

TUYER IRONS—Continued.

CLARK'S PATENT—Continued.



SECTIONAL VIEW.

We would invite the attention of those using Tuyer Irons to Clark's Patent Tuyer.

In all other patterns of Tuyer Irons, the fire has frequently to be broken down to take out the dirt in order to get a clear draft, or the small dirt has to remain in the fire until large cinders are formed, before you can remove it; and even with all this time and labor, the fire is liable to be constantly choked up, nor can the fire be relied upon to heat where it is required, and without close attention is liable to burn the Iron.

There are many other serious obstacles to the perfect operation of the old Tuyer Irons, which every Smith has experienced, and the want of a Tuyer that would obviate all objections to which the old patterns were subject, has been found in Clark's Tuyer.

The peculiar advantages which Clark's Tuyer has over all others in use is, that it requires but one-third of the labor in working the bellows. The fire does not run but keeps in the centre; you have a continuous and steady blast; it gives always a clear, bright fire; does not clog nor choke up, and enables the Smith to avoid all dead air in the Forge; the fire can be cleaned in a moment's time without disturbing it.

By the use of Clark's Tuyer Iron, there is a saving of Twenty-five per cent. in fuel and time; more work can be performed with it in a given time, with less labor, than with any other Tuyer Iron ever invented.

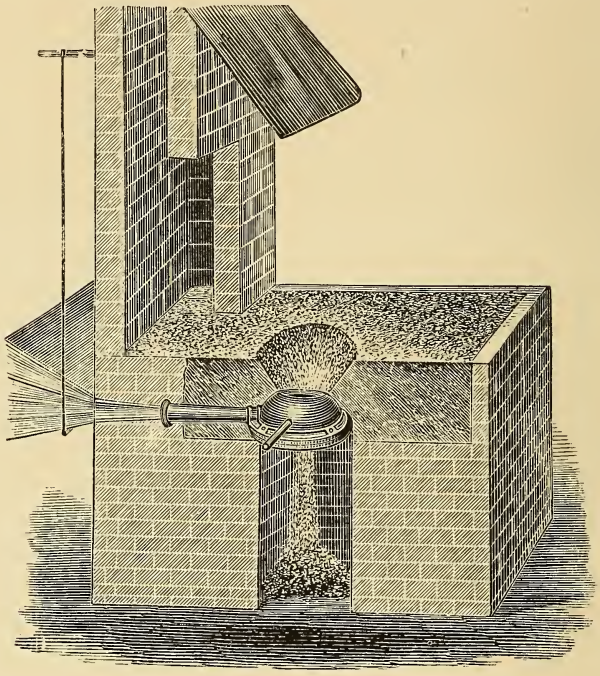
TUYER IRON — Continued.

CLARK'S PATENT — Continued.

This Tuyer is not now an experiment, as hundreds in all branches of Forge work, from the lightest to the heaviest, who are now using them can attest. In all the requisites that go to form a perfect Tuyer Iron, this patent has no equal, and wherever introduced, has given perfect satisfaction in every respect; superseding all others. They are simple in construction, not liable to get out of repair, and no more trouble is required in setting them than the plainest Tuyer in use.

We have sizes adapted to the kind of work to be performed. Our No. 1 is used for small and very light work. Our No. 2 is used for carriage ironing and horse shoeing. Our No. 3 is intended for middling or ordinary heavy work, and our No. 4, or largest size, will be found sufficient for the largest and heaviest Forge work.

TUYER IRONS—Continued.



SECTIONAL VIEW OF FORGE.

The above cut represents a sectional view of Forge, with the manner in which the CLARK TUYER IRON must be set, in order to have it perform its work in the most effectual way.

The top of the Tuyer must always be placed below the face of the Forge at the following depth.

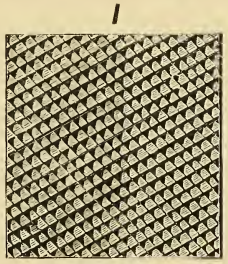
For No. 1 and 2, 5 inches. No. 3, 7 inches. No. 4, 9 inches.
For Blast Fire, 1 inch deeper than above.

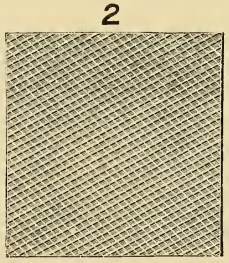
To clean the fire, keep up a gentle blast and break the cinders; then give the rod at side of Forge, which is attached to the Valve or Ball of Tuyer, a quick, vibratory motion and it will remove all the dirt and cinders.

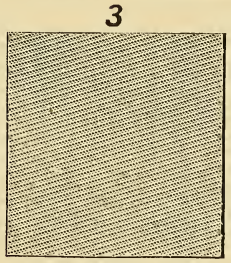
By having a sufficient quantity of Coal between the Tuyer and the Iron, it not only prevents the wind from cooling the Iron while in process of heating, but is a saving in Coal, and causes a quicker, greater, and more regular heat.

The necessity of following closely the above directions, will be obvious to every practical Smith.

FILES.


1
ROUGH.


2
BASTARD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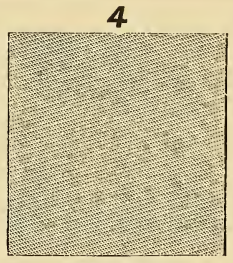
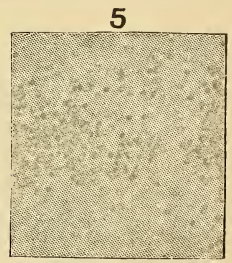
SECOND CUT.


4
SMOOTH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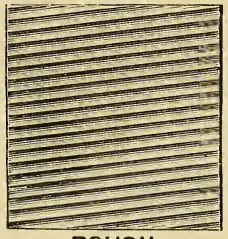
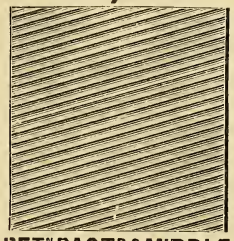
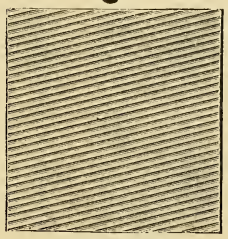
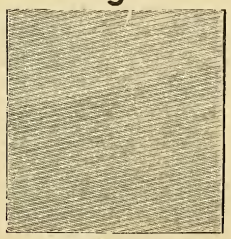
DEAD SMOOTH.


6
ROUGH.


7
BETWEEN BASTARD & MIDDLE


8
BASTARD.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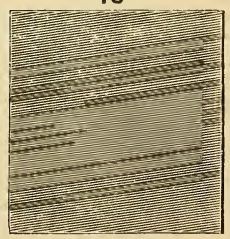
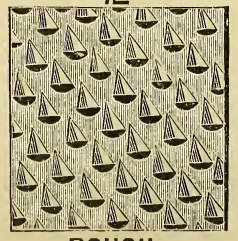
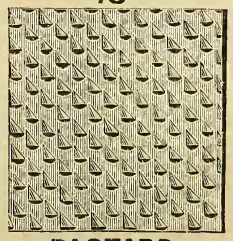
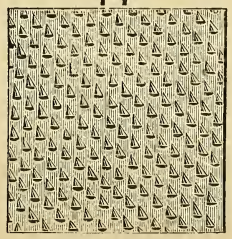
SECOND CUT.

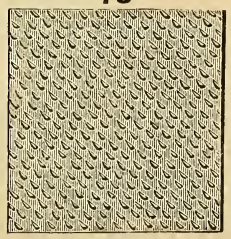

10
SMOOTH.

11
HORSE.


12
ROUGH


13
BASTARD.


14
SECOND CUT.


15
SMOOTH.

FILES.

$10.00 to the Pound Sterling.

	Flat, Warding, Mill Saw, Square, (8½ inch and upwards,) Cotter Taper Points.			Half Round, Round, 3 Square, 4 Square, to 8 inch Horse, Shoe and Flat Wood Rasps, Double Cut Mills.			Hand, Pillar, Round-off, Bone, and Flat with two Round Edges.		
Inch.	Rough and Bastard.	Second Cut.	Smooth and Cabinet Files.	Rough and Bastard.	Second Cut.	Smooth and Cabinet Rasps.	Rough and Bastard.	Second Cut.	Smooth.
1 to 4	2 00	2 38	2 76	2 08	2 60	2 88	2 16	2 50	2 96
5	2 34	2 66	3 08	2 50	3 00	3 38	2 50	2 88	3 42
6	2 76	3 08	3 76	3 00	3 50	4 00	3 34	3 76	4 58
7	3 34	3 76	4 58	3 50	4 26	4 76	4 00	4 76	5 42
8	4 00	4 76	5 42	4 26	5 26	5 76	4 88	5 76	6 26
9	4 88	5 76	6 26	5 26	6 26	6 76	5 88	6 88	7 38
10	5 88	6 88	7 38	6 26	7 26	8 00	6 88	8 26	8 76
11	6 88	8 26	8 76	7 50	9 00	10 00	8 26	10 00	10 50
12	8 26	10 00	10 50	9 26	11 00	12 26	9 76	12 00	13 00
13	9 76	12 00	13 00	10 76	13 00	15 00	11 50	14 00	15 00
14	11 50	14 00	15 00	13 00	15 00	17 00	14 26	17 00	18 00
15	14 26	17 00	18 00	16 00	18 00	20 00	17 26	20 00	22 00
16	17 26	20 00	22 00	19 00	21 50	24 00	20 50	23 50	27 00
17	20 50	23 50	27 00	22 00	25 50	29 00	24 00	28 50	32 00
18	24 00	28 50	32 00	26 00	30 00	34 00	27 50	33 50	37 00
20	31 50	38 50	42 50	34 00	40 50	46 00	36 00	43 50	46 00

FILES — Continued.

Equalling, Cant, Slotting, Riffler, Blunt Mill Saw and Cotter, Tanged Horse Rasps.

Inch.	Bastard.	Second Cut.	Smooth.	Tanged Horse Rasps.
1 to 4	2 76	3 08	3 76	
5	3 34	3 76	4 58	
6	4 00	4 76	5 42	
7	4 88	5 76	6 26	
8	5 88	6 88	7 38	
9	6 88	8 26	8 76	
10	8 26	10 00	10 50	
11	9 76	12 00	13 00	11 50
12	11 50	14 00	15 00	14 26
13	15 26	17 00	18 00	17 26
14	17 26	20 00	22 00	20 50
15	20 50	23 50	27 00	24 00
16	24 00	28 50	32 00	27 50

Taper, Frame and Pit Saw Files.

Inch.	Taper Second Cut Single.	Tapers Double Cut to Point.	Pit or Frame.
1 to 3½	1 66	2 38	2 00
4	1 88	2 62	2 16
4½	2 12	3 04	2 42
5	2 38	3 62	2 76
5½	2 66	4 26	3 26
6	3 26	4 62	3 76
6½	3 88	5 26	4 26
7	4 26	5 76	4 76
8	5 26	6 76	6 00
9	6 26	8 76	7 26
10	8 26	10 50	9 00
11	10 00	12 00	11 00
12	12 00	14 00	13 00

Hook Saw.

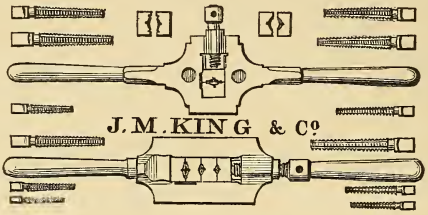
6	5 26
7	6 26
8	7 26
9	9 00
10	11 00

HORSE RASPS. — "Heller's."

14 inch - - - - -	$13.00 per doz.
15 inch - - - - -	14.00 "
16 inch - - - - -	15.00 "

These rasps are made from the very best material, and cut by hand; we consider them superior to any rasp sold in this market.

STOCKS AND DIES.



MANUFACTURERS' LIST—Revised March 2, 1868.

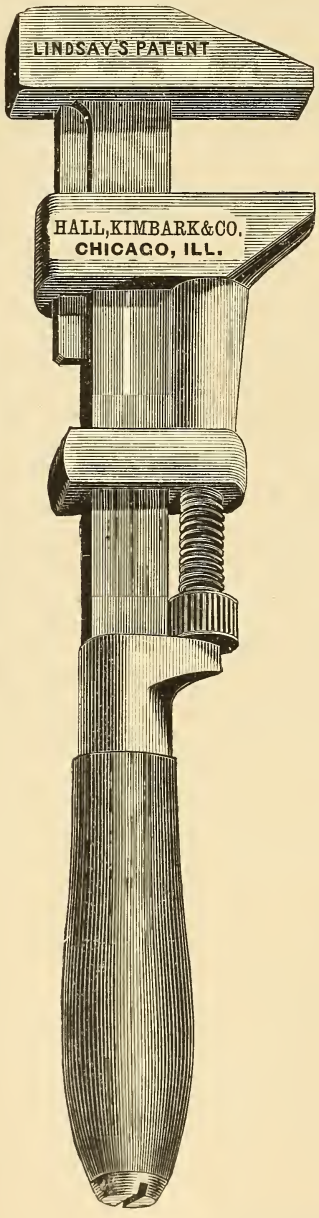
NO.	PRICE.	SIZE. LEFT HAND.	SIZE. RIGHT HAND.	TAPS.	DIES.
1	$60.00	2 in. to 1 in.	2 in. to 1 in.	8	4
2	60.00		2 do. $\frac{7}{8}$ do.	8	4
3	45.00	$1\frac{3}{4}$ do. $\frac{7}{8}$ do.	$1\frac{3}{4}$ do. $\frac{7}{8}$ do.	8	4
4	45.00		$1\frac{3}{4}$ do. $\frac{3}{4}$ do.	8	4
5	35.00	$1\frac{1}{2}$ do. $\frac{3}{4}$ do.	$1\frac{1}{2}$ do. $\frac{3}{4}$ do.	8	4
$5\frac{1}{2}$	35.00		$1\frac{1}{2}$ do. $\frac{3}{4}$ do.	8	4
6	20.00	$1\frac{1}{2}$ do. 1 do.	$1\frac{1}{2}$ do. 1 do.	4	2
7	12.00	$1\frac{1}{4}$ do. $\frac{7}{8}$ do.	$1\frac{1}{4}$ do. $\frac{5}{8}$ do.	6	3
9	12.00		$1\frac{1}{4}$ do. $\frac{1}{2}$ do.	6	3
11	10.00	$1\frac{1}{4}$ do. $\frac{7}{8}$ do.	$1\frac{1}{4}$ do. $\frac{5}{8}$ do.	4	3
15	10.00		$1\frac{1}{4}$ do. $\frac{1}{2}$ do.	5	3
17	9.00	1 do. $\frac{3}{4}$ do.	1 do. $\frac{1}{2}$ do.	6	3
19	9.00		1 do. $\frac{3}{8}$ do.	6	3
21	6.00	1 do. $\frac{3}{4}$ do.	1 do. $\frac{1}{2}$ do.	4	3
23	5.00		1 do. $\frac{3}{8}$ do.	3	3
25	6.50	$\frac{3}{4}$ do. $\frac{1}{2}$ do.	$\frac{3}{4}$ do. $\frac{3}{8}$ do.	6	3
27	6.50		$\frac{3}{4}$ do. $\frac{3}{8}$ do.	6	3
32	5.00	$\frac{3}{4}$ do. $\frac{3}{8}$ do.	$\frac{3}{4}$ do. $\frac{3}{8}$ do.	4	4
33	4.00	$\frac{3}{4}$ do. $\frac{1}{2}$ do.	$\frac{3}{4}$ do. $\frac{1}{2}$ do.	2	2
34	4.50		$\frac{3}{4}$ do. $\frac{5}{16}$ do.	3	3
35	4.00		$\frac{3}{4}$ do. $\frac{3}{8}$ do.	2	2
37	4.25		$\frac{5}{8}$ do. $\frac{3}{16}$ do.	6	3
38	4.50	$\frac{5}{8}$ do. $\frac{7}{16}$ do.	$\frac{5}{8}$ do. $\frac{5}{16}$ do.	6	3
41	3.25		$\frac{1}{2}$ do. $\frac{1}{8}$ do.	6	3
42	3.50	$\frac{1}{2}$ do. $\frac{5}{16}$ do.	$\frac{1}{2}$ do. $\frac{3}{16}$ do.	6	3
45	5.50	$\frac{5}{8}$ do. $\frac{7}{16}$ do.	$\frac{5}{8}$ do. $\frac{5}{16}$ do.	6	3
47	5.50		$\frac{5}{8}$ do. $\frac{1}{4}$ do.	6	3
49	4.50	$\frac{1}{2}$ do. $\frac{5}{16}$ do.	$\frac{1}{2}$ do. $\frac{1}{4}$ do.	6	3
51	4.50		$\frac{1}{2}$ do. $\frac{3}{16}$ do.	6	3
53	2.75		$\frac{5}{16}$ do. $\frac{1}{16}$ do.	4	4

STOCKS AND DIES—Continued.

EXTRA TAPER AND PLUG TAPS.

SIZE.	NO. OF THREADS TO INCH.		PRICE EACH.
	RIGHT.	LEFT.	
$\frac{1}{8}$ inch,	30 and 32,		30 cents.
$\frac{3}{16}$ do.	24, 26 and 28,		30 do.
$\frac{1}{4}$ do.	18, 20, 22, 24 and 26,		30 do.
$\frac{5}{16}$ do.	16, 18, 20 and 22,		30 do.
$\frac{3}{8}$ do.	12, 14, 16 and 18,		35 do.
$\frac{7}{16}$ do.	12, 14, 16 and 18,	14,	40 do.
$\frac{1}{2}$ do.	12, 14 and 16,	12 and 14,	40 do.
$\frac{9}{16}$ do.	12 and 14,	12,	50 do.
$\frac{5}{8}$ do.	10, 12 and 14,	10 and 12,	50 do.
$\frac{3}{4}$ do.	7, 8, 9, 10 and 12,	10 and 12,	65 do.
$\frac{7}{8}$ do.	9 and 10,	9,	90 do.
1 do.	7, 8 and 9,	8 and 9,	$1.25
$1\frac{1}{4}$ do.	6, 7, 8 and 9,	8 and 9,	1.75
$1\frac{1}{2}$ do.	6, 7 and 8,	6, 7 and 8,	3.00

WRENCHES.



LINDSAY'S IMPROVED.

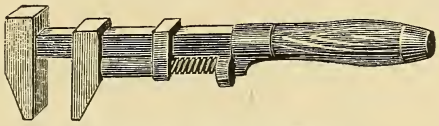
The rib on the back of the bar (see cut) is forged with it, and prevents the same from bending or breaking. The ferrule at the junction of the screw and handle has double bearings inside, and is put on under a thousand pounds pressure, which obviates any liability to impinge on the screws or "handle nut," and renders it impossible to force the ferrule back or out of place by pressure. The workmanship is perfect. The parts are case-hardened and interchangeable, and subject to rigid inspection, as in gun-work. The material is warranted of the best quality.

BLACK.

10 inch, - -	$14.00 per doz.
12 do. - -	16.00 do.
15 do. - -	24.00 do.

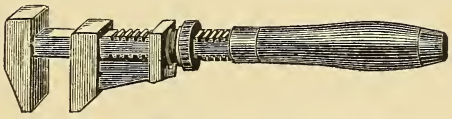
A case of 10 inches contains -	6 doz.
do. 12 do. -	6 do.
do. 15 do. -	4 do.

WRENCHES — Continued.



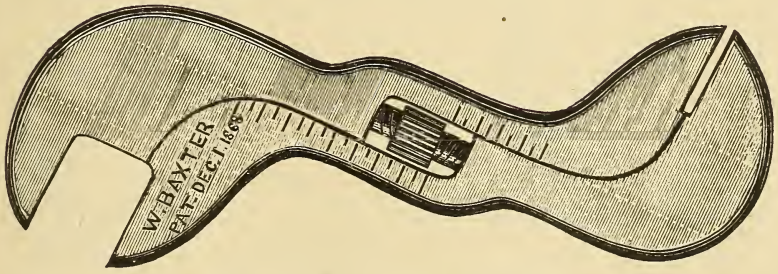
COE'S PATENT.

	BRIGHT.		BLACK.	
6 inch,	$10.00 per doz.		6 inch,	$9.00 per doz.
8 do.	11.00 do.		8 do.	10.00 do.
10 do.	14.00 do.		10 do.	12.00 do.
12 do.	16.00 do.		12 do.	14.00 do.
15 do.	26.00 do.		15 do.	24.00 do.
18 do.	32.00 do.		18 do.	30.00 do.
21 do.	38.00 do.		21 do.	36.00 do.



TAFT'S PATENT.

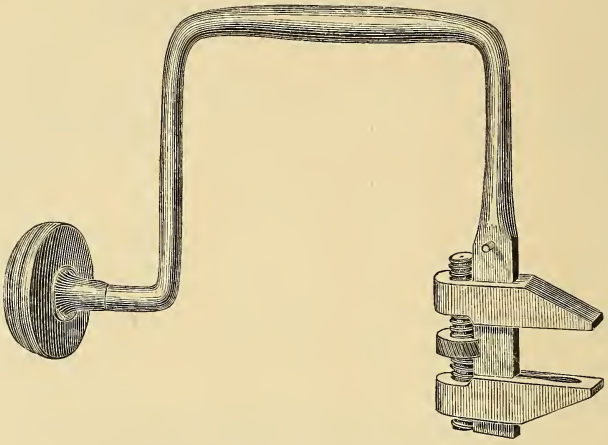
	BRIGHT.		BLACK.	
6 inch,	$10.00 per doz.		6 inch,	$9.00 per doz.
8 do.	11.00 do.		8 do.	10.00 do.
10 do.	14.00 do.		10 do.	12.00 do.
12 do.	16.00 do.		12 do.	14.00 do.
15 do.	26.00 do.		15 do.	24.00 do.
18 do.	32.00 do.		18 do.	30.00 do.
21 do.	38.00 do.		21 do.	36.00 do.



BAXTER'S PATENT.

6 inch,	$12.00 per doz.
8 do.	13.50 do.
10 do.	18.00 do.
12 do.	22.00 do.
15 do.	30.00 do.
21 do.	60.00 do.

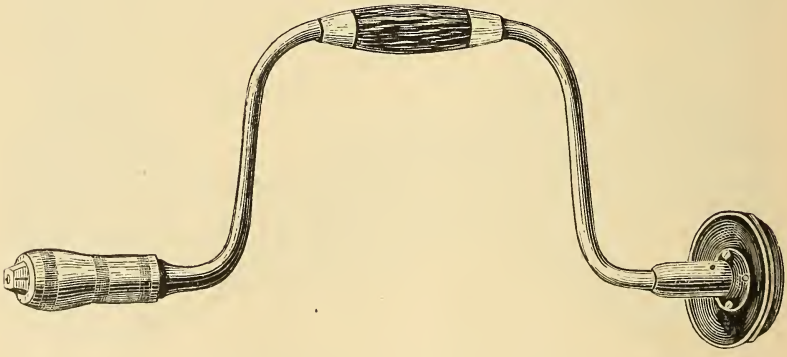
WRENCHES — Continued.



BRACE WRENCH.

Brace Wrench, - - - - - $30.00 per doz.

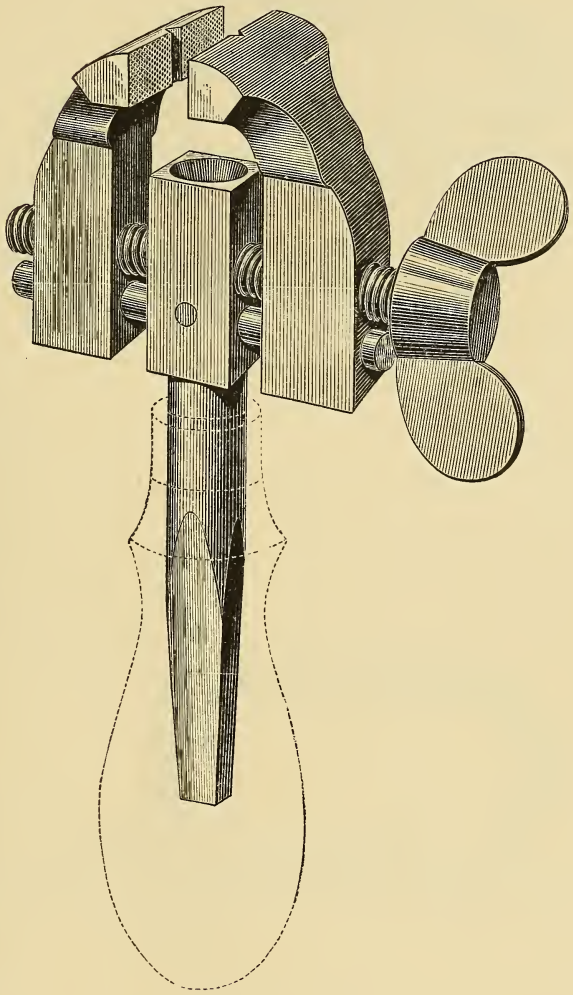
BIT BRACE.



BARBER'S SELF FITTING.

No. 0—14 inch sweep,	- - - -	$33.00	per doz.
1—12	do. - - - -	30.00	do.
2—10	do. - - - -	27.00	do.
3— 8	do. - - - -	24.00	do.
4— 6	do. - - - -	21.00	do.

HAND VISE AND DRILL CHUCK.

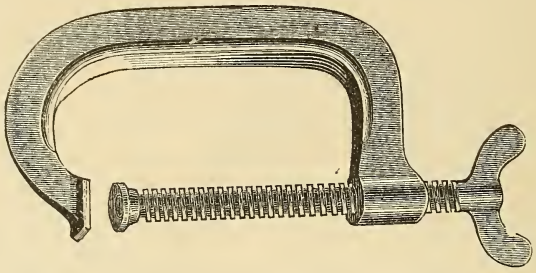


W. X. STEVENS' PATENT.

Price, - - - - - - $24.00 per doz.

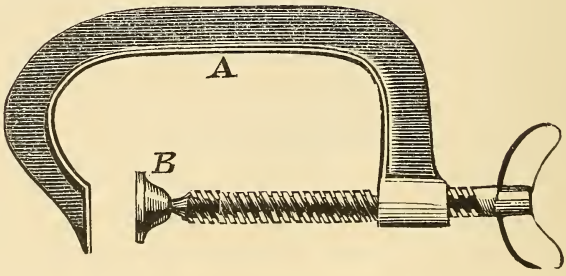
This vise is bright finished, with hardened jaws and steel screws. The shank is fitted for lathe and bit brace, and the cup in its upper end, with the grooves in the jaws, hold the twist drill firm and central.

CLAMPS.



PLAIN.

No. 00—Opening	2	inches,	- - - -	$2.75	per doz.
0— do.	$2\frac{1}{2}$	do.	- - - -	3.75	do.
1— do.	3	do.	- - - -	5.00	do.
2— do.	4	do.	- - - -	7.50	do.
3— do.	$5\frac{1}{2}$	do.	- - - -	9.00	do.
4— do.	7	do.	- - - -	11.00	do.
5— do.	8	do.	- - - -	13.00	do.
6— do.	10	do.	- - - -	15.00	do.



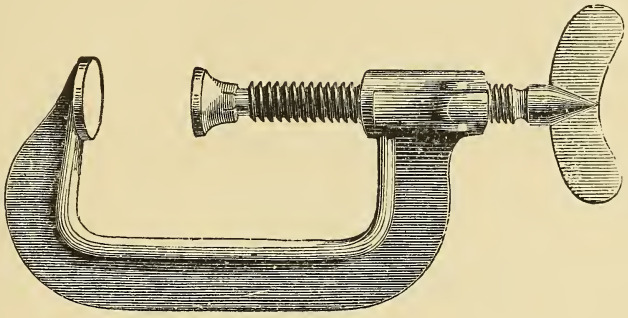
IMPROVED.

No. 1—Opening	3	inches,	- - - -	$5.00	per doz.
2— do.	$4\frac{1}{2}$	do.	- - - -	8.00	do.
3— do.	6	do.	- - - -	12.00	do.
4— do.	10	do.	- - - -	19.00	do.

This clamp has a flange, A, on inside edge, which gives it additional strength.

The end of the screw revolves in a socket, B, whereby it adapts itself to any bevel, and prevents the article clamped from being defaced.

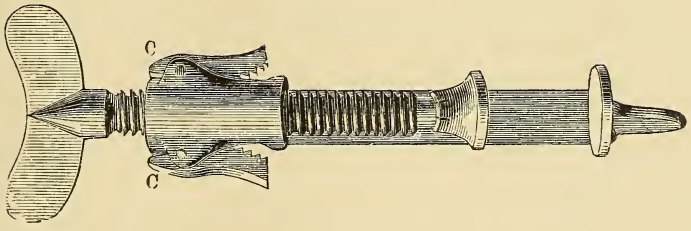
CLAMPS — Continued.



ADJUSTABLE.

2 inch—Opening	2	inches,									$4.75	per	doz.
3	do.	do.	3	do.							6.00	do.	
4	do.	do.	4	do.							9.00	do.	
5	do.	do.	5	do.							10.00	do.	
6	do.	do.	6	do.							13.50	do.	
7	do.	do.	7	do.							15.00	do.	
8	do.	do.	8	do.							17.00	do.	

With rubber caps, $1.00 per dozen extra.

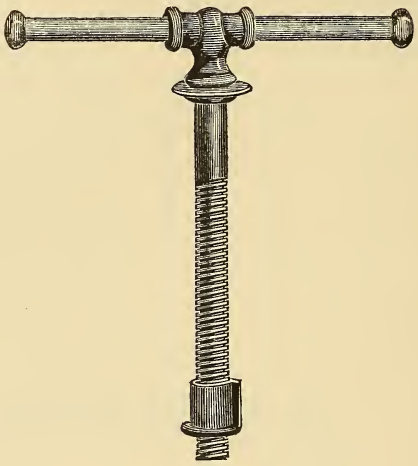


The advantages derived from the use of these clamps will be obvious to all familiar with the ordinary style.

By placing the thumb and forefinger on the levers, CC, the jaws are opened, allowing the screw to move back or forward to any required position, without turning.

The use of rubber caps on the buttons at end of screw, to prevent indentation, etc., will be found very desirable.

BENCH SCREWS.

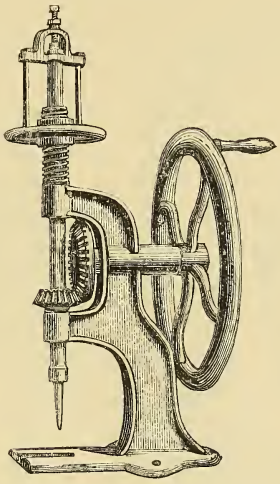


MOVABLE COLLAR AND DOUBLE THREAD.

WOOD HANDLES.

1	inch, wrought iron,	- - - -	$11.00 per doz.
1 1/8	do.	do. - - - -	12.00 do.
1 1/4	do.	do. - - - -	13.50 do.
1 1/2	do.	do. - - - -	20.50 do.

DRILL.



RASTETTER'S IMPROVED.

Price - - - - - - - - $25.00 each.

This drill is made in the best and most durable manner, is compact in construction. We would call particular attention to the steel set-screw, running into a steel pivot, offering the least possible surface for friction.

The weight of this machine is one hundred pounds, is cheaper than any other drill made, and, if desired, can be run by power by removing balance wheel and putting pulley on shaft.

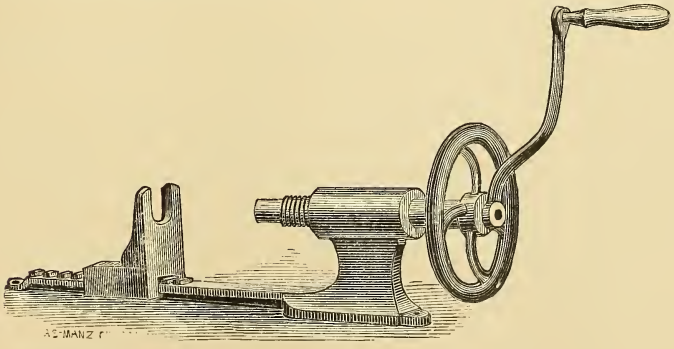
We have three different styles, each costing the same—

No. 1—For ordinary blacksmiths' use.

No. 2—Same style as No. 1, geared slower for heavier work.

No. 3—Geared still slower, with brass pinion, giving additional strength and intended expressly for plow and other steel work.

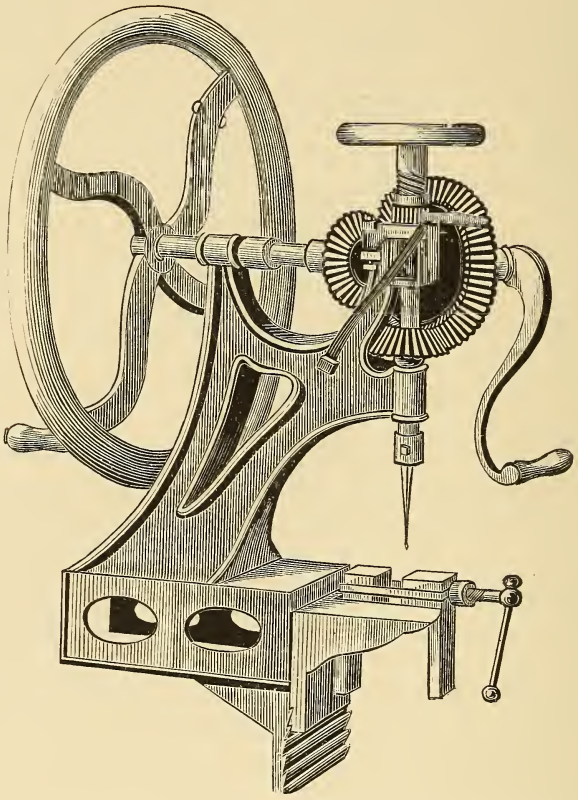
Warranted to give satisfaction.



TIRE.

Improved pattern, - - - - - $5.00 each.

DRILLS—Continued.



COE'S SELF-FEEDING UPRIGHT.

No. 0.—Weighs	100 lbs.	- - - - -	$30.00
No. 1.— do.	135 lbs., with vise and feed attachment	-	45.00
No. 2.— do.	200 do. do. do.	-	65.00

No. 0.—Made without self-feeding and vise attachment, is suitable for all ordinary blacksmith's work.

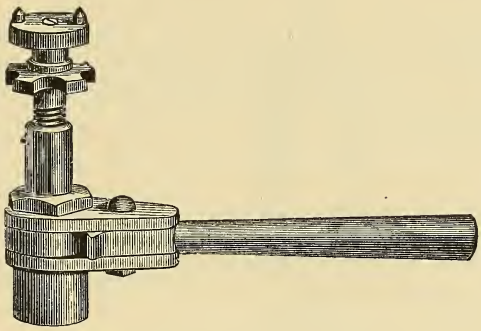
No. 1.—With self-feeding and vise attachment, suitable for wagon and carriage makers, and for drilling any hole up to 2in. in diameter.

No. 2.—Suitable for heavy work ; plow makers, machinists, etc., etc. ; with self-feeding and vise attachment.

By its adaptation to both heavy and light work, this machine combines both speed and power ; and at the same time, being so perfectly simple and strong, it is not liable to get out of order.

By putting a pulley on the shaft near the balance wheel, No. 2 can be readily run by power if desired.

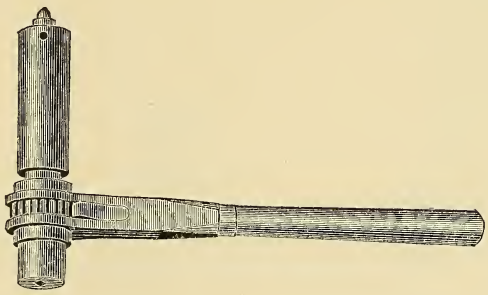
RATCHETS.



BISHOP'S FRICTION.

No. 1—With Self-feeding Attachment,	10	in. handle,	-	$12.50	each.
2 do. do.	12	do.	-	15.50	do.
3 do. do.	15	do.	-	18.00	do.
4 do. do.	17	do.	-	22.00	do.
5 do. do.	20	do.	-	26.00	do.

Without Self-feeding Attachment, $2.00 less each.



PACKER'S.

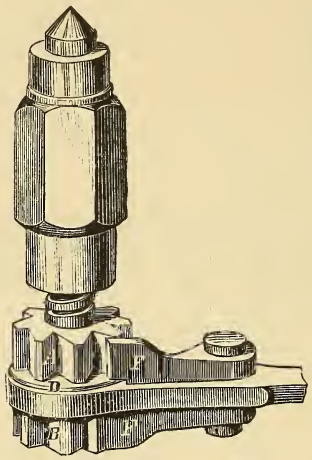
No. 1—10	in. handle,	-	-	$10.50	each.
2—12	do.	-	-	13.50	do.
3—15	do.	-	-	16.00	do.
4—17	do.	-	-	19.50	do.
5—20	do.	-	-	23.00	do.

PACKER'S BOILER.

No. 1, - - $9.00 each. | No. 2, - - $10.00 each.

RATCHETS—Continued.

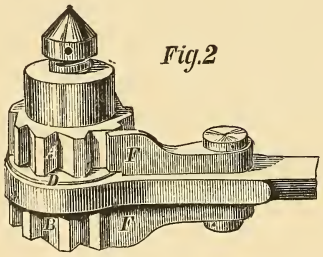
Fig.3



WESTON'S PATENT—No. 3.

12 inch,	- - - - - - -	$ 8.00 each.
14 do.	- - - - - - - -	8.75 do.
16 do.	- - - - - - -	9.50 do.
18 do.	- - - - - - - -	10.75 do.
20 do.	- - - - - - -	11.25 do.
22 do.	- - - - - - - -	13.00 do.

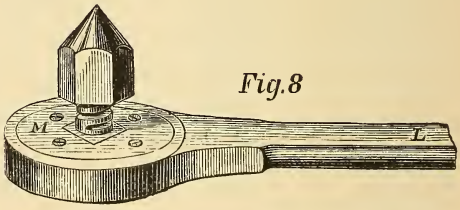
Fig.2



WESTON'S PATENT. No. 2.

14 inch, - - $8.75 each.

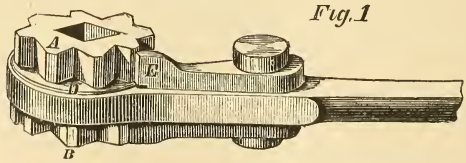
Fig.8



WESTON'S PATENT. No. 8.

14 inch, - - $13.00 each.

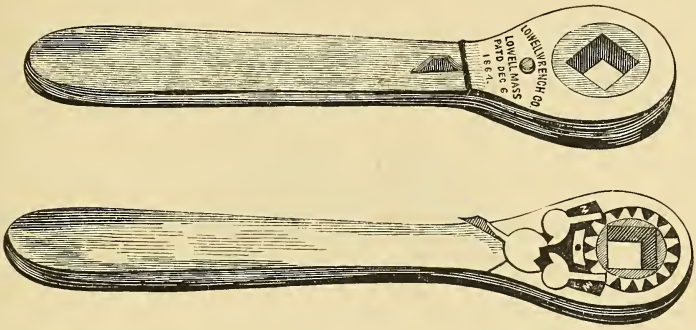
Fig.1



WESTON'S PATENT, No. 1.

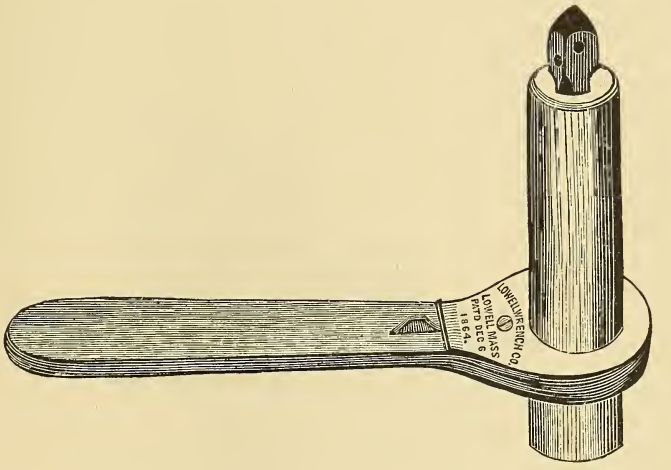
18 inch, - - - - - - $9.50 each.

RATCHETS — Continued.



MOORE'S TRIPLE ACTION WRENCH.

No. 1—	$\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ inch—	four sq. and	$\frac{5}{8}$, $\frac{3}{4}$ inch—	six sq.	$3.00 each.
2—	$\frac{3}{4}$ do.		$\frac{7}{8}$, 1 do.	do.	4.00 do.
3—	1 do.		$1\frac{1}{8}$, $1\frac{3}{8}$	do.	5.00 do.
4—	$1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$	do.	$1\frac{3}{4}$,	do.	7.00 do.
5—	$1\frac{3}{4}$, 2, $2\frac{1}{4}$ $2\frac{1}{2}$	do.	2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$,	do.	10.00 do.



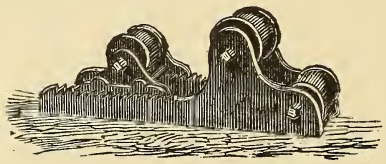
MOORE'S TRIPLE ACTION DRILL.

No. 1—	8 in. lever,	$5.00 each.
2—	10 do.	6.50 do.
3—	14 do.	8.00 do.
4—	16 do.	10.00 do.

Extra Wrench Gears, Nos. 1 and 2, 50 cents each; Nos. 3 and 4, 75 cents each; No. 5, $1.00 each.

TIRE BENDERS.

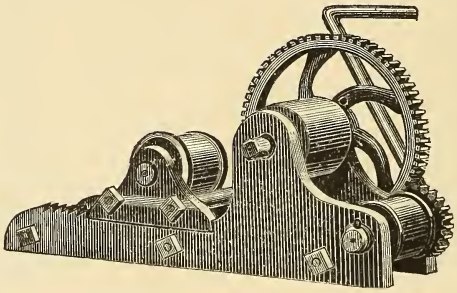
No. 1.



COMMON.

Price,	$10.50 each.
Length,	23 inches.
Diameter of end rollers,	3¼ do.
Diameter of centre do.	4 do.
Length of rollers,	3¼ do.

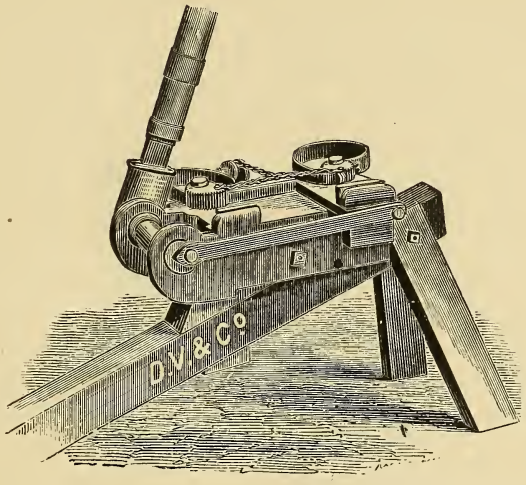
No. 2.



IMPROVED.

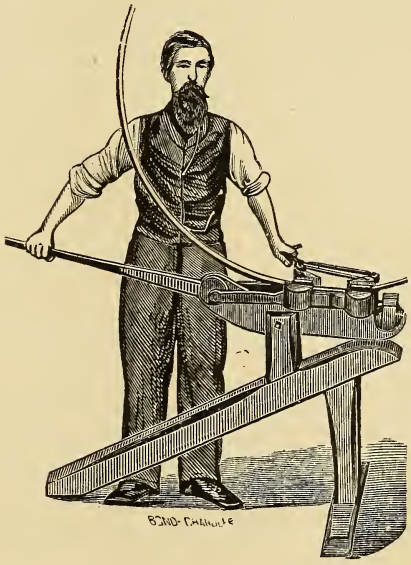
Price,	$14.00 each.
Length,	23 inches.
Diameter of end rollers,	3¼ do.
Diameter of centre do.	4 do.
Length of rollers,	3¼ do.
Diameter of large cog-wheel,	11 do.

TIRE SHRINKERS.



WIRT'S PATENT.

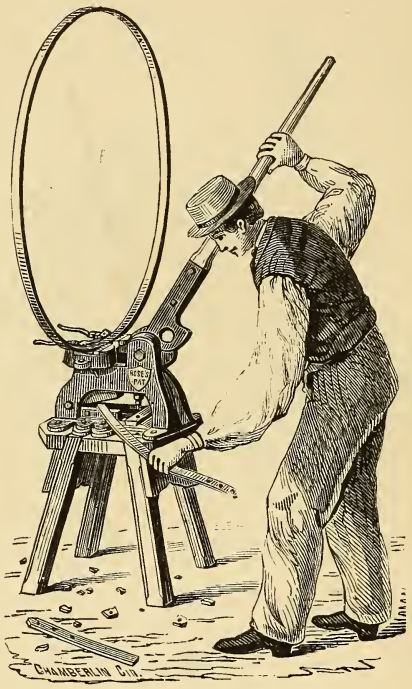
Price - - - - - - - - $25.00 each.



OLMSTED & DINSMORE'S PATENT.

Price - - - - - - - - $30.00 each.

TIRE SHRINKERS—Continued.



ROSE'S PATENT TIRE UPSETTER, PUNCH AND SHEARS.

No. 1.—Large size combined machine, to upset 5 in. tire, cut $\frac{1}{2}$ in. and punch $\frac{3}{8}$ cold iron - - - - $75.00

No. 2.—Large single machine, to upset 5 in. tire - - 35.00

No. 3.—Large single machine, to cut $\frac{1}{2}$ in. and punch $\frac{3}{8}$ in. cold iron - - - - - - 45.00

No. 4.—Small combined machine, to upset 2 in. tire, cut $\frac{3}{8}$ in. and punch $\frac{1}{4}$ in. cold iron - - - - 50.00

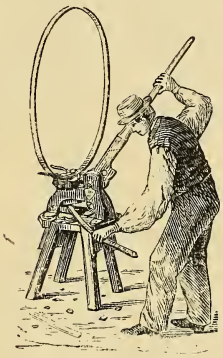
No. 5.—Small single machine, to upset 2 in. tire - - - 25.00

No. 6.—Small single machine, to cut $\frac{3}{8}$ in. and punch $\frac{1}{4}$ in. cold iron - - - - - - 30.00

No. 7.—Large punch and shears, specially adapted to plow work, will punch steel and cut the same 14 ins. in one direction - - - - - - 100.00

See page 147.

TIRE SHRINKERS—Continued.



ROSE'S PATENT TIRE UPSETTER, PUNCH AND SHEARS—Continued.

Advantages of this Machine.

1.—It is a labor saving machine, saving more than one day's time in the ironing of a single wagon, doing its work better than ordinarily done by hand labor, paying for itself in a few months.

2.—The leverage is such that 100 lbs. weight on the lever gives a pressure of 15,000 lbs. on punch and shears.

3.—It will upset equally well the tire of the heaviest wagon or the lightest buggy.

4.—It cuts and punches with the greatest ease and exactness iron from $\frac{3}{16}$ to $\frac{3}{8}$ in. thickness.

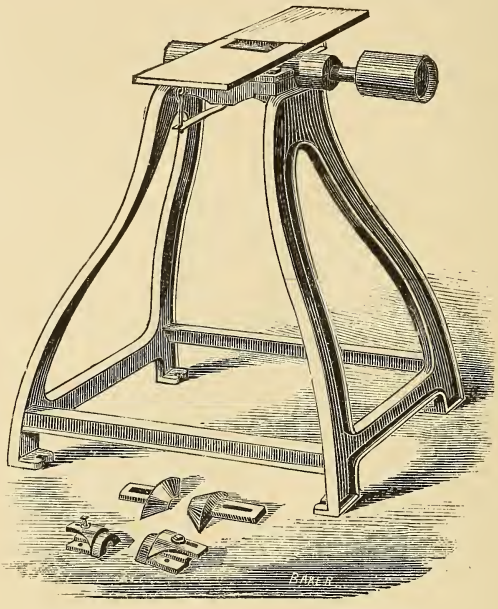
5.—The machine occupies very little room, only measuring 9 x 20 in.

6.—No other machine, occupying the same space, combines as many useful inventions.

7.—Its simplicity renders it the most durable and reliable machine of the kind ever yet offered to the public.

8.—The machine weighs from 200 to 300 lbs.

PLANER.

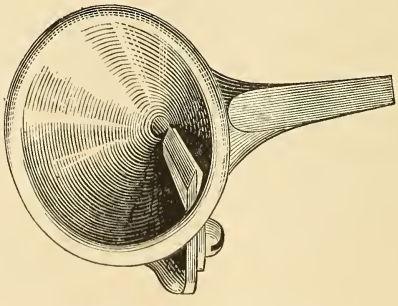


ROSE'S PATENT.

For planing plow beams, felloes and crooked stuff.

Price - - - - - - - $75.00 each.

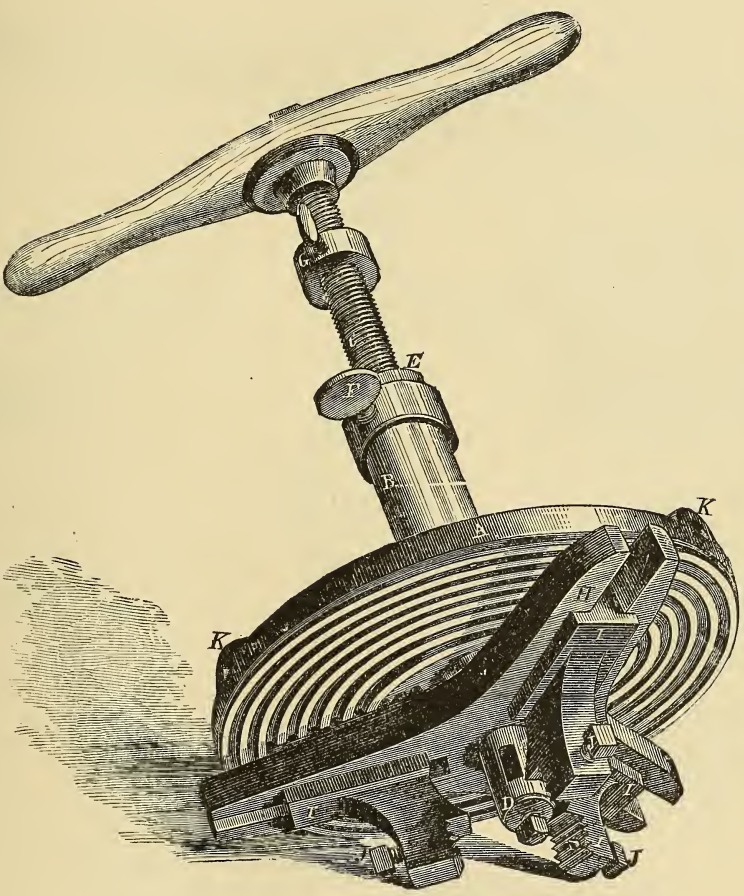
SPOKE POINTER.



IVES' PATENT.

Price, - - - - - - $15.00 per doz.

HUB BOXING MACHINES.

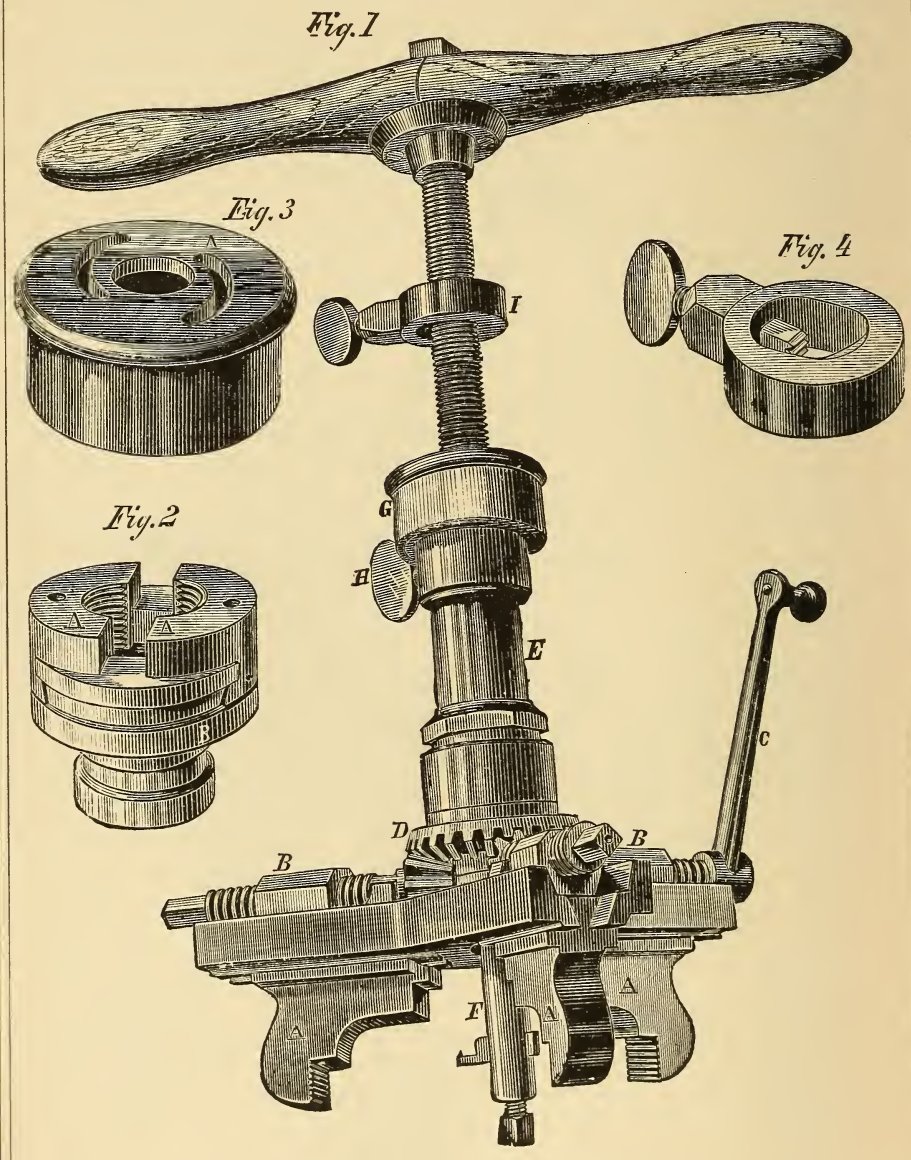


DOLE'S PATENT SELF-CENTRING.

No. 1—Small, adapted to buggies and light work,	-	$18.00 each.
2—Medium, do. carriages and light wagons,	-	21.00 do.
3—Large, do. wagon and heavy wheels,	-	24.00 do.
Gauge Plate and Feed Nut, - -	-	5.00 do.

The above cut represents the Old Standard Hub Boxing Machine, which is well known and appreciated. This machine works equally well for all kinds of boxes, and by having the sized machine adapted for the class of work cannot fail to give perfect satisfaction.

HUB BOXING MACHINES—Continued.



SILVER'S PATENT SELF-CENTRING.

Price of machine (complete) - - - - $28.00 each.
Extra mandrel and extra bits - - - - 3.50 do.

See page 151.

HUB BOXING MACHINES — Continued.

SILVER'S PATENT SELF-CENTRING — Continued.

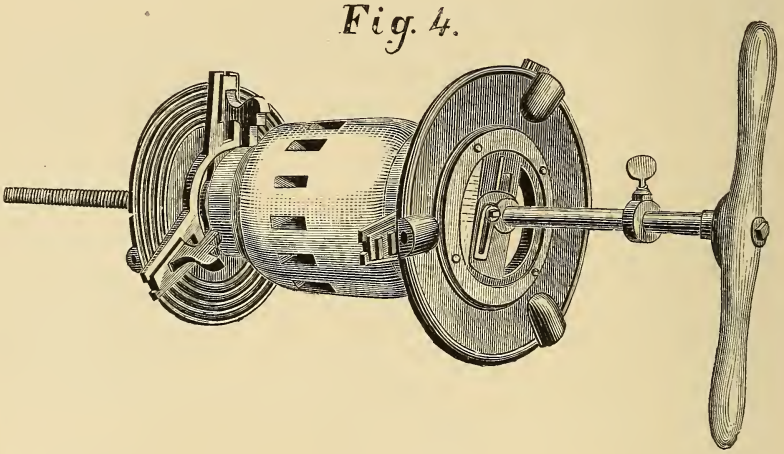
Fig. 1 of cut, on the opposite page, represents Silver's patent self-centring Hub Boxing Machine, which is pronounced by all who are acquainted with it, the best boxing machine in use, while it combines all the advantages of all other machines for boring hubs, it has several new and important features not possessed by others, which render it greatly superior as a labor-saving machine.

Among the new features, and one of the most important, is the open or adjustable feed nut, which is made in two sections, and which, by a slight turn of the cap to the left, is separated so that the mandrel can be lifted out at once when the desired depth has been bored in the hub, (which will save much time). The gauge plate or nut can be raised or lowered on the mandrel without turning, and firmly secured at any point. The self-centring chuck is so arranged that the griping jaws are all moved to or from the center by turning one screw; and the screws being applied directly to the jaws are of great advantage in securing the machine to the hub, saving at least one half of the leverage required with other machines.

There being no plate over the centre arms of the chuck, the operator can see at a glance that the jaws are properly adjusted on the hub. As there are two griping surfaces or shoulders to the jaws—one for small and one for large hubs—one machine is sufficient for all ordinary light and heavy work. Taking into consideration all the advantages possessed by this machine, it is confidently believed to be the best hub-boxing machine in market. Those who wish to do extra light work can use this machine by ordering an extra mandrel turned down small at the lower end with extra small bits for that purpose.

HUB BOXING MACHINES—Continued.

Fig. 4.



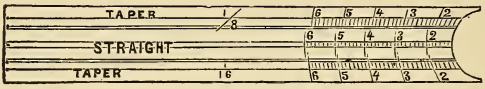
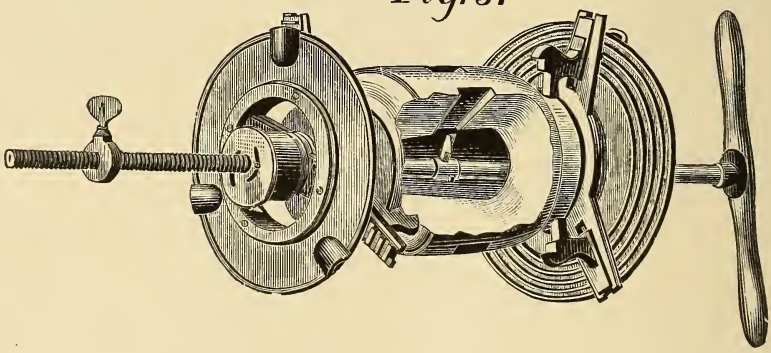


Fig. 5.



SILVER'S DOUBLE CHUCK TAPER.

Price - - - - - - - - $35.00 each.

See page 153.

HUB BOXING MACHINES—Continued.

SILVER'S DOUBLE CHUCK TAPER—Continued.

Fig. 4 brings into view the outside of the large or butt chuck, and shows the revolving disk, together with the adjusting slide through which the mandrel passes, and by which it is thrown out of centre when a taper cut is to be made. An index, as shown in this cut, is attached to the disk, by which the mandrel is readily set to cut any degree of taper required.

Fig. 5 is an opposite view of the machine, showing the outside of the small or point chuck, and bringing into prominent view the Silver patent open feed nut and adjustable gauge plate, by the use of which, as applied to this machine, a square shoulder is readily cut in either end of the hub, and by a simple half turn of the nut cap the mandrel is released, and can be withdrawn at once without turning, which greatly facilitates the work by saving much time and labor.

This machine cuts with equal facility straight as well as taper holes, and is most admirably adapted to pipe boxes and all classes of heavy work, and is, in fact, almost indispensable to wagon-makers doing the kind of work named. There being two shoulders or griping surfaces on the jaws, gives it a wider range of capacity, grasping hubs from three to twelve inches in diameter. It will be observed that the whole operation, including the cutting of recesses in both ends of the hub, as well as squaring the shoulders, is performed without changing the position of the machine on the hub.

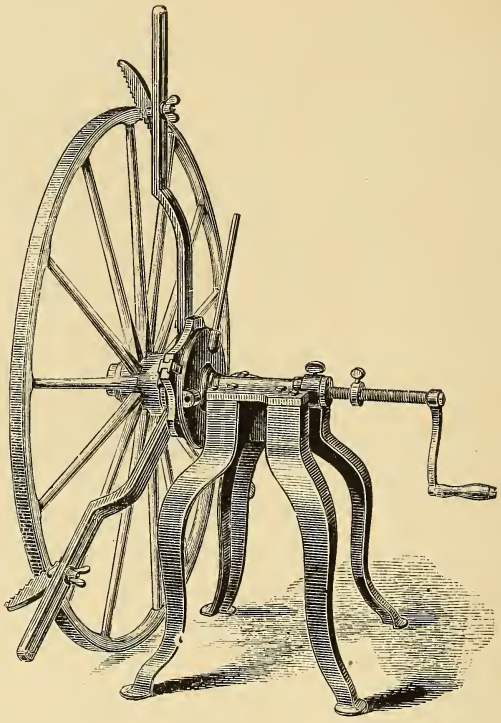
Each machine is accompanied by Silver's adjusting rule, one end of which is concave, to fit the enlarged portion of the mandrel where the bit is inserted. See engraving.

Both margins of this rule are graduated to suit different degrees of taper, while the center is marked for straight holes.

By means of this rule the bit is readily set to cut any desired size by simply placing the concave end on the mandrel close to the bit, and setting the point of the bit to the figure or mark indicating the size required. Much valuable time is saved by the use of this little device in adjusting the bit.

Considering the combination, superiority of workmanship, strength and durability, we do not hesitate to say we believe this to be greatly superior to any other taper machine in use, and are confident it will give entire satisfaction.

HUB BOXING MACHINES—Continued.



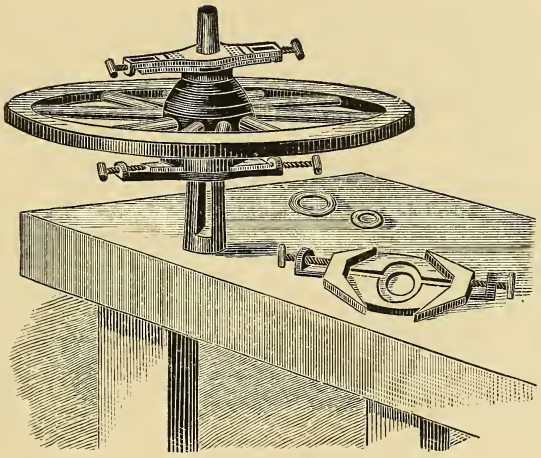
DOLE'S PATENT SELF-CENTRING ARM.

Price, - - - - - - - - $45.00 each.

This machine is designed for those doing light carriage work. It centres by the hub, same as the "Old Standard" machine, *but trues by the rim of the wheel*, which is a great advantage in light work. Turned boxes can be set true, and the machine can be used for setting all kinds of light boxes.

This machine is all iron, and is substantially made. Weight, 130 lbs.

HUB REAMER.

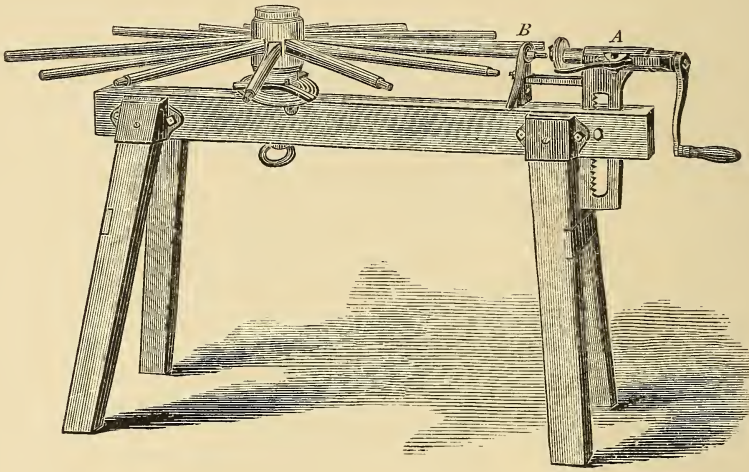


BREMERMAN'S SELF-CENTRING.

Power Machine, - - - - -	$80.00 each.
Hand do. - - - - - -	40.00 do.

This machine is so simple that any person can learn to operate it in fifteen minutes' time. To adjust it, select from the set of rings one which will fit the small end of the box to be used, and place it upon the reamer. Then select another enough larger to pass down the reamer, so that the distance between the rings will be one-half inch greater than the length of the hub. Place the rings in the chucks, and adjust and fasten them to the hub. Place the wheel on the reamer; hook the chains to opposite spokes, passing them outside the felloes, and connect the power. Be sure and poke down the shavings as fast as they accumulate. This is done by working the little rod up and down through the top reamer. The hand machine is operated by turning the wheel; the reamer is made stationary. We furnish twenty-six rings with each machine, assorted so they will fit any sized box, from $2\frac{1}{4}$ to 6 inches. The reamer should run about thirty-three revolutions per minute. A hub can be reamed in less than two minutes, with power; by hand, in about five minutes. The work done by this machine is entirely satisfactory, being a perfect fit for the boxes, making a smooth, tapering hole, clipping the ends of the spokes, without splitting the hub in the least; hence not weakening the hub about the tenons of the spokes. Every machine warranted to give satisfaction.

SPOKE TENONING MACHINE.



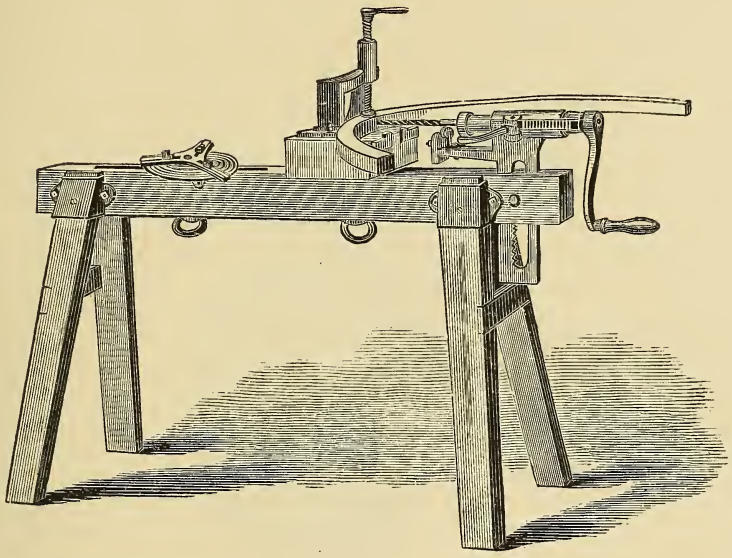
DOLE'S PATENT, WITH HUB ATTACHMENT.

No. 1.—Small size - - - - - -	$25.00 each.
No. 2.—Large size - - - - - -	35.00 do.
Felloe boring attachment for small machine - -	6.00 do.
do. do. do. large do. - -	8.00 do.
Self-centring chuck small do. - -	4.00 do.
do. do. large do. - -	4.00 do.
Extra cutters for large machine - - - -	1.00 do.

This is the best machine for cutting round tenons in use. The hollow auger is fitted on a mandrel that works through a bearing in the casting A, (see illustration) an arm of which projects out under the auger that is provided with a rest and dog B, that centres the spoke while the auger is starting on, thus centring all the spokes the same, so that the tenons will cut exactly true, and in less time than it would take to sharpen the spokes for the common hollow auger. There is also a feed lever to use in finishing the shoulder, that the crank may be forced up to the end of the bearing box, thereby making a perfectly square shoulder. It will be observed that the head is raised or lowered in the frame by means of a shaft and pinion to suit different length hubs, being held to its place by tightening the nut on the shaft. Is furnished with a brace shank with which the auger can be used in a brace.

Two sizes of this machine are made. The small size cuts from $\frac{7}{16}$ to 1 in.; the large cuts from $\frac{3}{4}$ to $1\frac{1}{4}$ and 4 ins. long. The large machine is made heavy and strong, and is furnished with legs. The small hollow auger cannot be applied to the large machine, or the large to the small.

SPOKE TENONING MACHINE—Continued.



DOLE'S PATENT, WITH ATTACHMENTS.

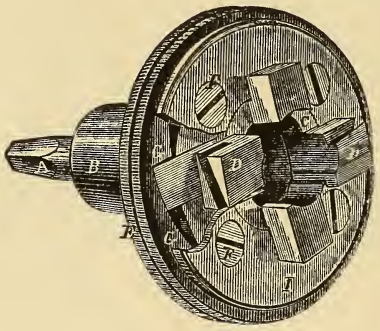
Small size, - - - - - - -	$25.00 each.
Large size, - - - - - - -	$35.00 do.
Felloe boring attachment for small machine - -	6.00 do.
do. do. do. large do. - -	8.00 do.
Self centring chuck small do. - - -	4.00 do.
do. do. large do. - -	4.00 do.
Extra cutters for large machines - - - -	1.00 do.

The above cut represents the same machine changed to a boring machine. To make this change, remove the hollow auger from the mandrel, and substitute in its place a chuck for holding auger bits; put on the table or block for holding the work to be bored, and you have a complete machine for boring felloes, etc., perfectly true, and the tenons also being cut true, a better wheel can be made than by any other method.

For convenience in shipping, these machines are only made with the straight frame, but are shown with legs as a trussel, so that parties wishing can put legs on them, or use them in a vise, or clamped to the bench.

ADJUSTABLE HOLLOW AUGER.

Fig. 3



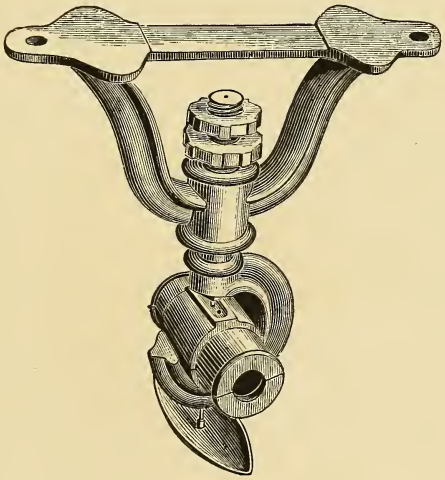
DOLE'S PATENT.

Price - - - - - - - -	$9.00 each.
Cutters for hollow augers - - - - -	1.50 pair.
Blanks - - - - - - - -	1.00 do.

Hollow auger for brace, is a first-class tool, fitted up in good style, will cut any size tenon from $\frac{7}{16}$th to 1 in.; is easily adjusted, and not liable to get out of order.

Cutters for the hollow auger are made exact duplicates, and can be got at any time to fit, and being light, can be sent to any part of the United States by mail.

HANGER.

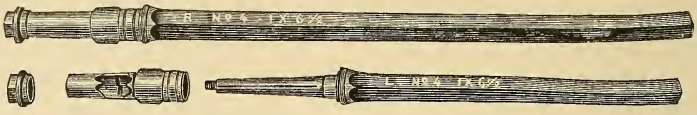


PATENT ADJUSTABLE.

No. 1—Size of journal box, 1 to $1\frac{3}{4}$ in.; drop, 12 to 14 in. - per ℔.
2— do. do. $1\frac{7}{8}$ to $2\frac{1}{2}$ in.; do. 15 to 18 in. - do.
3— do. do. $2\frac{1}{2}$ to $3\frac{1}{2}$ in.; do. 16 to 20 in. - do.

WEIGHT—No. 1, 33 ℔s.; No. 2, 75 ℔s.; No. 3, 145 ℔s.

AXLES.



ANCHOR.

	¾ to 1	1⅛	1¼	1⅜	1½	1⅝	1¾
No. 1—Swelled Taper, improved solid collar, Short stock, -	$5.00	$6.00	$7.25	$9.50	$12.00	$15.00	$18.50
No. 2—Swelled Taper, improved solid collar, Long stock, -	7.00	8.00	9.75	13.00	16.00	20.00	24.00
No. 3—Half Patent, improved solid collar, Short stock, -	5.50	6.50	7.75	10.00	12.50	15.50	19.00
No. 4—Half Patent, improved solid collar, Long stock, -	7.50	8.50	10.25	13.50	16.50	20.50	25.00

FINE PATTERN—Extra Quality Iron, Finished Nuts, and Steel Converted, for Small Hubs.

	¾ to 1	1⅛	1¼
No. 5—Swelled Taper, improved solid collar, Short stock, - - - S. C.	$7.00	$8.00	$9.50
No. 6—Swelled Taper, improved solid collar, Long stock, - - - do.	9.50	10.50	12.50
No. 7—Half Patent, improved solid collar, Short stock, - - - do.	7.50	8.50	10.00
No. 8—Half Patent, improved solid collar, Long stock, - - - do.	10.00	11.50	13.50

BESSEMER STEEL—For Small Hubs.

	¾	⅞	1
No. 13—Half Patent, improved solid collar, Short stock, - - -	$10.50	$11.50	$12.50
No. 14—Half Patent, improved solid collar, Long stock, - - -	13.00	14.00	15.00

For capping nuts on any of the above sizes or styles, 50 cents extra per set.

For case-hardened axles, ¾ to 1⅜ inches, 50 cents extra per set.

For do. do. 1½ in. and larger, $1.00 do. do.

AXLES—Continued.

D. DALZELL & SONS.

BESSEMER STEEL.

	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$
Mail pat., long stock, solid collar - -		$13.00	$14.00	$15.00	$18.00	$21.00	24.00	$28.50
Mail pat., short stock, solid collar - -		11.00	11.00	12.00	14.50	17.00	21.00	25.00
Half pat., long stock, solid collar - -	$12.00	12.00	12.50	13.00	16.00	19.50	23.00	27.00
Half pat., short stock, solid collar - -	9.00	9.00	9.50	10.00	12.50	15.50	19.00	23.00

Swelled taper axles same price as half-patent.

N. B.—These axles are made from Bessemer steel. They are very durable and elegantly finished.

FIRST QUALITY IRON.

	$\frac{3}{4}$ to $\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$
Mail patent, long stock, solid collar - -	$9.00	$10.00	$12.50	$15.00	$18.00	$21.00	$25.00
Mail patent, short stock, solid collar - -	8.00	8.50	10.50	12.50	14.50	17.00	21.00
Half patent, long stock, solid collar - -	8.50	9.00	10.50	12.50	14.50	17.00	
Half patent, short stock, solid collar - -	6.25	6.50	7.50	9.50	11.00	14.00	
Swelled taper, long stock, solid collar -	7.50	8.50	10.00	12.00	14.00	16.50	
Swelled taper, short stock, solid collar -	6.00	6.25	7.25	8.50	10.00	12.50	

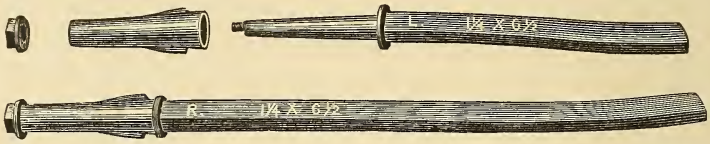
N. B.—Mail patent oil cup axles (iron or steel) $1\frac{1}{8}$ and smaller, $2.00 per set more than mail patent.

Mail patent oil cup axles (iron or steel) $1\frac{1}{4}$ and larger, $3.00 per set more than mail patent.

Composition boxes, on iron or steel axles, over iron boxes, on $\frac{5}{8}$ $2.00, $\frac{3}{4}$ $2.25, $\frac{7}{8}$ $2.50, 1 $3.25, $1\frac{1}{8}$ $4.75, $1\frac{1}{4}$ $5.00, per set.

No extra charge for fan tail stocks on steel or iron axles.

AXLES — Continued.



CONCORD — Genuine Eastern Make.

1⅛ × 6	—Long stock,	- - - -	$8.50 per set.
1⅛ × 6½	do.	- - - - -	8.50 do.
1⅛ × 7	do.	- - - -	8.50 do.
1¼ × 6½	do.	- - - - -	8.50 do.
1¼ × 7	do.	- - - -	8.50 do.
1¼ × 7½	do.	- - - - -	8.50 do.
1⅜ × 7	do.	- - - -	10.25 do.
1⅜ × 7½	do.	- - - - -	10.25 do.
1⅜ × 8	do.	- - - -	10.25 do.
1½ × 7	do.	- - - - -	12.75 do.
1½ × 7½	do.	- - - -	12.75 do.
1½ × 8	do.	- - - - -	12.75 do.
1½ × 8½	do.	- - - -	12.75 do.
1⅝ × 8	do.	- - - - -	15.25 do.
1⅝ × 8½	do.	- - - -	15.25 do.
1⅝ × 9	do.	- - - - -	15.25 do.
1¾ × 8½	do.	- - - -	17.75 do.
1¾ × 9	do.	- - - - -	17.75 do.
1¾ × 9½	do.	- - - -	17.75 do.
1¾ × 10	do.	- - - -	17.75 do.
2 × 9	do.	- - - -	23.00 do.
2 × 9½	do.	- - - - -	23.00 do.
2 × 10	do.	- - - -	23.00 do.
2 × 10½	do.	- - - - -	23.00 do.

AXLES — Continued.

COMMON HALF PATENT.

1 × 6	—Long stock,	per lb.
1 × 6½	do.	do.
1 × 7	do.	do.
1⅛ × 6	do.	do.
1⅛ × 6½	do.	do.
1⅛ × 7	do.	do.
1¼ × 6	do.	do.
1¼ × 6½	do.	do.
1¼ × 7	do.	do.
1¼ × 7½	do.	do.
1⅜ × 6	do.	do.
1⅜ × 6½	do.	do.
1⅜ × 7	do.	do.
1⅜ × 7½	do.	do.

1 inch axles, - - - - - 1 cent extra per lb.

COMMON HALF PATENT.

⅞ × 6	—Short stock,	$3.75	per set.
⅞ × 6½	do.	3.75	do.
1 × 6	do.	3.75	do.
1 × 6½	do.	3.75	do.
1 × 7	do.	3.75	do.
1⅛ × 6	do.	4.25	do.
1⅛ × 6½	do.	4.25	do.
1⅛ × 7	do.	4.25	do.
1¼ × 6	do.	5.00	do.
1¼ × 6½	do.	5.00	do.
1¼ × 7	do.	5.00	do.
1¼ × 7½	do.	5.00	do.
1⅜ × 6	do.	5.75	do.
1⅜ × 6½	do.	5.75	do.
1⅜ × 7	do.	5.75	do.
1⅜ × 7½	do.	5.75	do.

AXLES — Continued.

COMMON.

1	×	6	—Long stock,	-		-		-		-	per ℔.
1	×	6½	do.		-			-		-	do.
1	×	7	do.	-		-		-		-	do.
1⅛	×	6	do.		-		-			-	do.
1⅛	×	6½	do.	-			-		-		do.
1⅛	×	7	do.		-		-		-		do.
1¼	×	6	do.	-		-		-		-	do.
1¼	×	6½	do.		-		-		-		do.
1¼	×	7	do.	-		-		-		-	do.
1¼	×	7½	do.		-		-		-		do.
1⅜	×	6	do.	-		-		-		-	do.
1⅜	×	6½	do.		-		-		-		do.
1⅜	×	7	do.	-		-		-		-	do.
1⅜	×	7½	do.		-		-		-		do.
1½	×	7	do.	-		-		-		-	do.
1½	×	7½	do.		-		-		-		do.
1½	×	8	do.	-		-		-		-	do.
1½	×	8½	do.		-		-		-		do.
1½	×	9	do.	-		-		-		-	do.
1⅝	×	8	do.		-		-		-		do.
1⅝	×	8½	do.	-		-		-		-	do.
1⅝	×	9	do.		-		-		-		do.
1¾	×	8½	do.	-		-		-		-	do.
1¾	×	9	do.		-		-		-		do.
1¾	×	9½	do.	-		-		-		-	do.
1¾	×	10	do.		-		-		-		do.
1¾	×	10½	do.	-		-		-		-	do.
2	×	9	do.		-		-		-		do.
2	×	9½	do.	-		-		-		-	do.
2	×	10	do.		-		-		-		do.
2	×	10½	do.	-		-		-		-	do.
2¼	×	10	do.		-		-		-		do.
2¼	×	10½	do.	-		-		-		-	do.
2¼	×	11	do.		-		-		-		do.
2½	×	10½	do.	-		-		-		-	do.
2½	×	11	do.		-		-		-		do.
2½	×	12	do.	-		-		-		-	do.

AXLES — Continued.

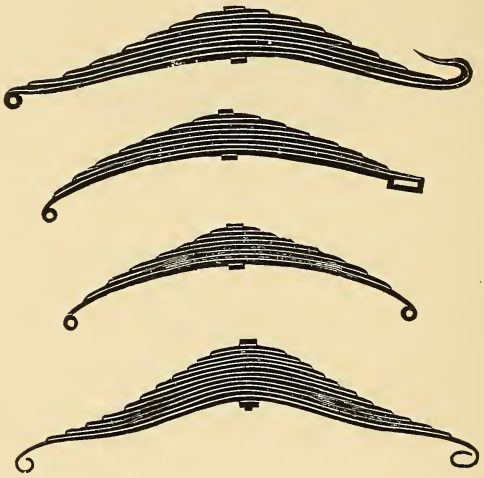
PIPE BOXES — Reamed.

To fit all sizes Common Axles (see page 164), - - per lb.

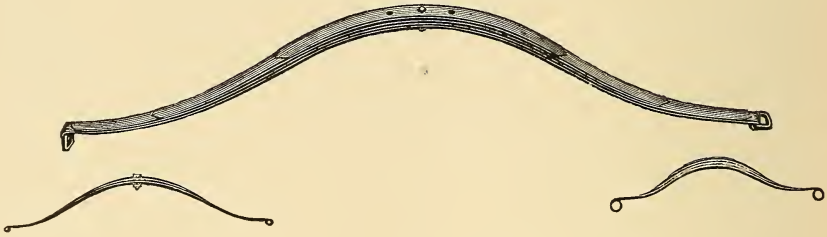
Eastern Manufacturers' Approximate Weights of Common Axles.

$\frac{7}{8}$,	33 lbs.
1,	41 do.
$1\frac{1}{8}$,	54 do.
$1\frac{1}{4}$,	64 do.
$1\frac{3}{8}$,	83 do.
$1\frac{1}{2}$,	100 do.
$1\frac{5}{8}$,	118 do.
$1\frac{3}{4}$,	137 do.
$1\frac{7}{8}$,	161 do.
2,	188 do.
$2\frac{1}{8}$,	210 do.
$2\frac{1}{4}$,	245 do.
$2\frac{1}{2}$,	305 do.
$2\frac{3}{4}$,	375 do.
3,	480 do.

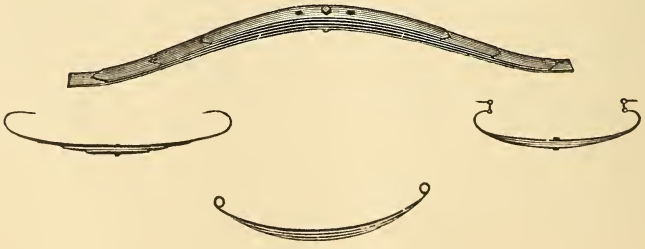
SPRINGS.



CAR SPRINGS.



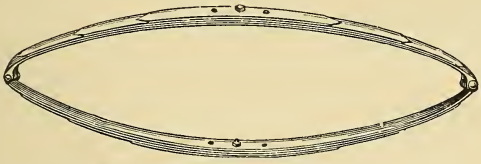
SIDE SPRINGS.



HALF SPRINGS.

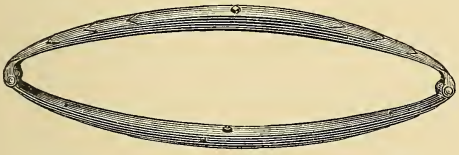
SPRINGS — Continued.

JENKS' SEAT SPRING.

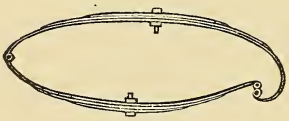


CARRIAGE — Common Shape.

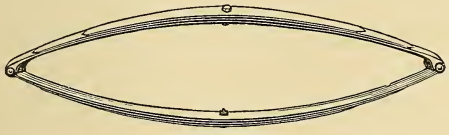
FULL C SPRING



EXPRESS — Common Shape.

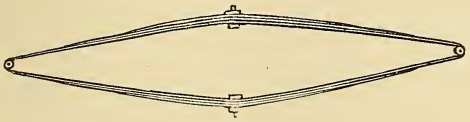


COMMON SCROLL.



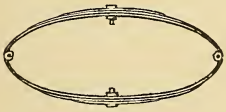
CLIPPER.

FRENCH
SCROLL AND CROSS.



PHILADELPHIA.

FRENCH
PLATFORM & CROSS.



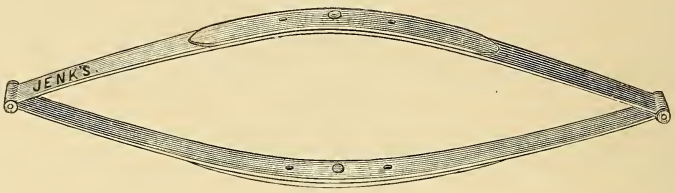
FRENCH.

FRENCH SCROLL.

COLLAPSE SHAPE.

FRENCH SCROLL

SPRINGS.



JENKS' BLUE SEAT.

$1\frac{1}{4} \times 2$, 24 inches long	- - - - -	$2.75 per pair.
$1\frac{3}{8} \times 2$, 25 do.	- - - - -	3.00 do.
$1\frac{1}{2} \times 2$, 26 do.	- - - - -	3.25 do.

For every inch above these lengths 10 cents extra.

Discounts—Ordinary lots	- - - - per cent.
250 pairs	- - - - do.
500 pairs	- - - - do.
1000 pairs	- - - - do.

$1\frac{1}{4} \times 3$, 24 inches long	- - - -	$2.75 per pair.
$1\frac{3}{8} \times 3$, 25 do.	- - - - -	3.00 do.
$1\frac{1}{2} \times 3$, 26 do.	- - - -	3.25 do.

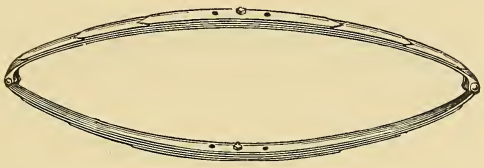
Discounts—Ordinary lots	- - - per cent.
250 pairs	- - - do.
500 pairs	- - - - do.
1000 pairs	- - - do.

We are the sole owners and manufacturers of the above popular spring. The brand was adopted by us in June, 1868, as our distinctive trade mark, and we shall prosecute all infringements.

They are made from Jenk's best spring steel, and tempered by a new process, which renders them more durable than any other spring in the market.

Every spring is warranted.

SPRINGS — Continued.



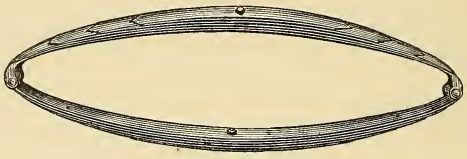
CARRIAGE.

1¼ × 3	weight per set, 29 lbs.	
1¼ × 4	do.	36 do.
1⅜ × 3	do.	31 do.
1⅜ × 4	do.	38 do.
1½ × 3	do.	37 do.
1½ × 4	do.	45 do.
1½ × 5	do.	53 do.
1½ × 6	do.	60 do.
1¾ × 4	do.	54 do.
1¾ × 5	do.	62 do.
1¾ × 6	do.	70 do.
2 × 4	do.	63 do.
2 × 5	do.	71 do.
2 × 6	do.	79 do.
2 × 7	do.	88 do.
2¼ × 6	do.	89 do.
2¼ × 7	do.	100 do.
2¼ × 8	do.	117 do.
2½ × 7	do.	125 do.
2½ × 8	do.	145 do.

1¼ in. springs 1 cent extra per lb.

Common	per lb.
Tempered,	do.
Oil tempered,	do.
Swedish steel, oil tempered,	do.

SPRINGS — Continued.



EXPRESS.

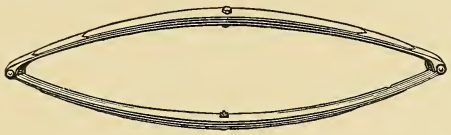
1¼ × 4 × 36	in.	long	per lb.
1½ × 3	do.	do.	do.
1½ × 4	do.	do.	do.
1½ × 5	do.	do.	do.
1½ × 6	do.	do.	do.
1¾ × 4	do.	do.	do.
1¾ × 5	do.	do.	do.
1¾ × 6	do.	do.	do.
2 × 4	do.	do.	do.
2 × 5	do.	do.	do.
2 × 6	do.	do.	do.
2 × 7	do.	do.	do.
2¼ × 6	do.	do.	do.
2¼ × 7	do.	do.	do.
2¼ × 8	do.	do.	do.
2½ × 7	do.	do.	do.
2½ × 8	do.	do.	do.

1¼ in. springs, - - - - - 1 cent extra per lb.

Tempered,	per lb.
Oil tempered	do.
Swedish steel, oil tempered,	do.

Express springs furnished either shorter or longer than 36 inches when required.

SPRINGS—Continued.



LEWIS' PATENT CLIPPER.

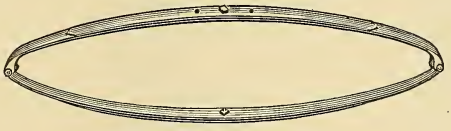
$1\frac{1}{4} \times 3$	per ℔.
$1\frac{1}{4} \times 4$	do.
$1\frac{1}{2} \times 3$	do.
$1\frac{1}{2} \times 4$	do.

$1\frac{1}{4}$ in. springs 1 cent extra per ℔.

Swedish steel, oil tempered	do.

These are to be clipped on the axles, like express springs.

The heads are made solid from the same bar of steel; no welding in any part of the spring. No holes or slots are punched in the leaves for the bud to work, thereby getting the full strength of the steel.



SULKY.

Oil Temper, Extra Quality.

$1\frac{1}{4} \times 2 \times 32$	per set.
$1\frac{1}{4} \times 3 \times 32$	do.
$1\frac{1}{2} \times 2 \times 32$	do.
$1\frac{1}{2} \times 3 \times 32$	do.

SPRINGS — Continued.

HALF.

1½ × 3	- - - -	Approximate weight per set,				19	lbs.
1½ × 4	- - - -	do.	do.	do.	23	do.	
1½ × 5	- - - -	do.	do.	do.	28	do.	
1¾ × 4	- - - -	do.	do.	do.	29	do.	
1¾ × 5	- - - -	do.	do.	do.	34	do.	
2 × 4	- - - -	do.	do.	do.	35	do.	
2 × 5	- - - -	do.	do.	do.	41	do.	
2 × 6	- - - -	do.	do.	do.	47	do.	

Tempered, - - - - -	per lb.
Oil tempered, - - - -	do.
Swedish steel, oil tempered, - - -	do.

SIDE.

1¼ × 4, with shackles - -	Approximate weight per set,				26	lbs.	
1¼ × 5	- - - -	do.	do.	do.	32	do.	
1½ × 4	- - - -	do.	do.	do.	32	do.	
1½ × 5	- - - -	do.	do.	do.	38	do.	
1¾ × 4	- - - -	do.	do.	do.	36	do.	
1¾ × 5	- - - -	do.	do.	do.	45	do.	

1¼ in. springs 1 cent extra per lb.

Tempered, - - - - -	per lb.
Oil tempered, - - - -	do.
Swedish steel, oil tempered, - - -	do.

THIMBLE SKEINS AND BOXES.

VIEW OF AXLE WITH ADJUSTABLE BEARINGS.

VIEW OF AXLE WITHOUT BEARINGS.

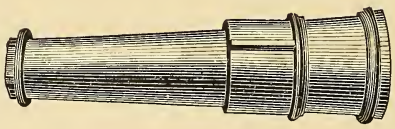
SECTIONAL VIEW.

LEWIS' HOLLOW AXLE—Wrought Iron.

SIZES.—2 inch by 8 inch; $2\frac{1}{4}$ by 9; $2\frac{1}{2}$ by 10; $2\frac{3}{4}$ by 11.

THIMBLE SKEINS AND BOXES — Continued.

CHICAGO.

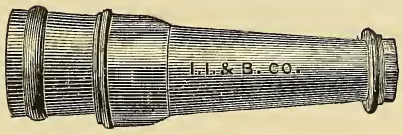


SEAMLESS — With Patent Chambered Box.

2¼ × 7,	$3.75	per set.
2⅜ × 7,	4.25	do.
2½ × 7½,	4.50	do.
2½ × 8,	4.60	do.
2¾ × 8,	4.90	do.
2¾ × 8½,	4.90	do.
3 × 9,	6.00	do.
3¼ × 9,	6.90	do.
3¼ × 10,	7.50	do.
3½ × 10,	8.00	do.
3½ × 10½,	8.00	do.
3½ × 11,	8.00	do.
3½ × 12,	8.05	do.
3¾ × 11,	8 25	do.
3¾ × 12,	8.60	do.
4 × 12,	9.75	do.
4¼ × 12,		do.
4½ × 13,		do.

THIMBLE SKEINS AND BOXES—Continued.

DUNDEE.

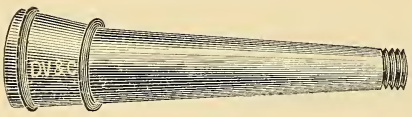


Cast from Divided Pattern.

2 × 6½,	$3.75	per set.
2⅛ × 6½,	3.75	do.
2⅛ × 7,	3.75	do.
2¼ × 7,	3.75	do.
2¼ × 7½,	3.90	do.
2⅜ × 7½,	4.25	do.
2½ × 7½,	4.50	do.
2½ × 8,	4.60	do.
2¾ × 8,	4.90	do.
2¾ × 8½,	4.90	do.
3 × 9,	6.00	do.
3¼ × 10,	7.50	do.
3½ × 10,	8.00	do.
3¼ × 11,	7.75	do.
3½ × 11,	8.00	do.
3½ × 12,	8.05	do.
3¾ × 11,	8.25	do.
3¾ × 12,	8.60	do.
4 × 12,	9.75	do.
4¼ × 12,	11.50	do.
4½ × 13,	12.65	do.

THIMBLE SKEINS AND BOXES—Continued.

KENOSHA.

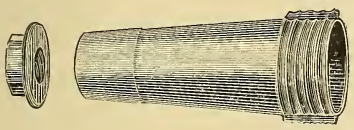


PATENT SEAMLESS—With Thread cut on.

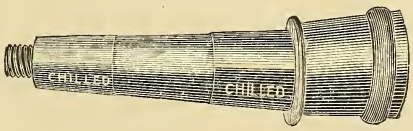
5 × 14,	$23.00	per set.
4½ × 13,	16.50	do.
4½ × 12,	14.00	do.
4¼ × 12½,	12.00	do.
4 × 12,	9.75	do.
3¾ × 12,	8.60	do.
3¾ × 11,	8.25	do.
3½ × 12,	8.05	do.
3½ × 11,	8.00	do.
3½ × 10½,	8.00	do.
3½ × 10,	8.00	do.
3¼ × 11,	7.75	do.
3¼ × 10,	7.50	do.
3¼ × 9,	6.90	do.
3 × 10,	6.90	do.
3 × 9,	6.00	do.
2¾ × 8½,	4.90	do.
2¾ × 8,	4.90	do.
2½ × 8,	4.60	do.
2½ × 7½,	4.50	do.
2¼ × 7,	3.75	do.
2 × 6,	3.50	do.

THIMBLE SKEINS AND BOXES—Continued.

No. 1.



No. 2.



THE SENECA FALLS CHILL HARDENED.

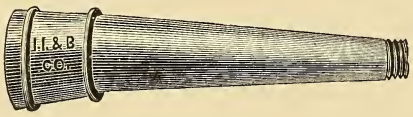
2	in.,	6½	in.	long, -	$3.75	per set.	3¼	in., 9	in. long, - $6.90 per set.
2⅛	do.	6½	do.	-	3.75	do.	3¼	do. 10	do. - 7.50 do.
2⅛	do.	7	do.	-	3.75	do.	3½	do. 10	do. - 8.00 do.
2¼	do.	7	do.	-	3.75	do.	3½	do. 11	do. - 8.00 do.
2¼	do.	7½	do.	-	3.90	do.	3½	do. 12	do. - 8.05 do.
2⅜	do.	7½	do.	-	4.25	do.	3¾	do. 11	do. - 8.25 do.
2½	do.	7½	do.	-	4.50	do.	3¾	do. 12	do. - 8.60 do.
2½	do.	8	do.	-	4.60	do.	4	do. 12	do. - 9.75 do.
2¾	do.	8	do.	-	4.90	do.	4¼	do. 12	do. - 11.50 do.
2¾	do.	8½	do.	-	4.90	do.	4½	do. 13	do. - 12 65 do.
3	do.	8½	do.	-	5.50	do.	5	do. 13	do. - 17.25 do.
3	do.	9	do.	-	6.00	do.	5¼	do. 14	do. - 19.00 do.

Cut No. 1 represents the corrugated pipe box, patented June 4, 1867. This is an entirely new improvement, and no one can fail to perceive its superiority over the common pipe box. It has always been a difficult matter to fasten the box into the hub so as to prevent its turning round, or pulling out of position. The small end of this box is driven into the hub until it fits tightly, when wedges are applied in the usual manner at the large end. The wood being forced into the corrugation, makes it impossible to wrench the box.

Cut No. 2 shows the chill hardened skein, which is also protected by letters patent. The process of chill hardening the lower part of the skein where the principal wear on it occurs, gives it a smooth surface, equal to steel in hardness and durability. We do not add the chill or corrugated box to any size under 3¼ inches.

THIMBLE SKEINS AND BOXES—Continued.

DUNDEE.

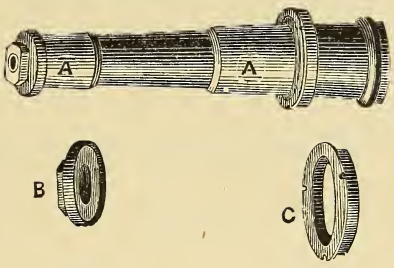


SEAMLESS—With Cut Thread.

3 × 9,	$6.00	per set.
3¼ × 10,	7.50	do.
3½ × 10,	8.00	do.
3½ × 11,	8.00	do.
3½ × 12,	8.05	do.
3¾ × 11,	8.25	do.
3¾ × 12,	8.60	do.

These skeins are made of the best charcoal iron, from new patterns, enlarged at the shoulder so as to take the largest quantity of wood, making them easily fitted to the axle.

THIMBLE SKEINS AND BOXES—Continued.



TURNED AND FITTED—With Iron Bearings.

3 × 9,	$6.00 per set.
3¼ × 10,	7.50 do.
3½ × 11,	8.00 do.
3¾ × 12,	8.60 do.

We desire to call the attention of the trade and consumers to the above skeins. They are made of iron, similar to the brass bearings, and are cast solid; then turned and fitted, and are, in point of draft, nearly, if not quite equal to the brass bearings.

AA represents the iron bearings; the space between the bearings should be covered with a woolen cloth, tightly sewed on, and saturated with oil. B is the nut with a flange, which covers the point of the box one-fourth of an inch. C is the sand-band, which screws on to the butt of the hub.

Both the boxes and skeins are turned nicely as iron axles.

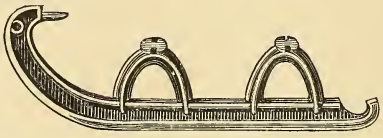
SLEIGH SHOES.

COMMON.

Cast iron, - - - - - - per. ℔

Length, 36 inches; approximate weight per set, 71 lbs.
do. 38 do. do. do. do. 73 do.
do. 40 do. do. do. do. 75 do.
do. 42 do. do. do. do. 77 do.

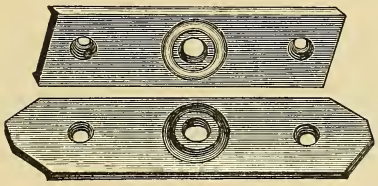
Made to order, any length.



LOCKWOOD & FREDERICK'S PATENT.

Cast Iron, weight of each runner about 50 lbs. - $16.00 per set.

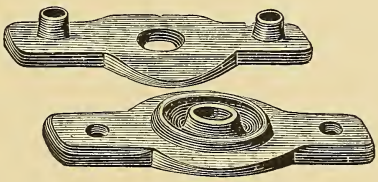
BOLSTER PLATES.



WROUGHT.

Made similar to cast bolster plates, with raised and indented circles, combining all the advantages of the cast and wrought.

2¾	in. wide,	⅜	in. thick,	1	inch hole,	-	-	48	cents	per	pair.
3	do.	⅜	do.	1⅛	do.	-	-	50	do.	do.	
3¼	do.	⅜	do.	1¼	do.	-	-	53	do.	do.	
3½	do.	⅜	do.	1¼	do.	-	-	55	do.	do.	



MILES' PATENT.

Made of cast iron, and in such a manner that it will not work loose from the bolster. The raised circles around the bolt holes enter the wood from ⅝ to ¾ of an inch, and thus secure the bolster firmly in its place.

No.	Length.	Width at End.	Width at Centre.	Centre to Centre of Bolt Hole.	Size of King Bolt.	Price.
1	8 inch,	2¼ inch,	3¼ inch,	6 inch,	⅞ inch,	70 c. per pr.
2	9 do.	2⅜ do.	3¾ do.	6¾ do.	1⅛ do.	80 c. do.
3	10 do.	2⅝ do.	5 do.	7 do.	1⅛ do.	$1.00 do.
4	11 do.	2¾ do.	5½ do.	8 do.	1¼ do.	1.20 do.

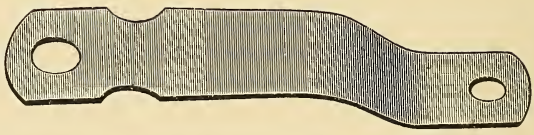
COMMON.

No. 1—	10 inch,	heavy,	-	-	-	-	75	cents per pair.
2—	9 do.	medium,	-	-	-	-	55	do.
3—	8 do.	light,	-	-	-	-	45	do.

WAGON HARDWARE.

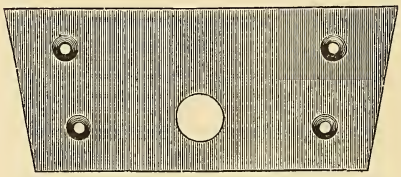
TONGUE CAPS.

Wrought Iron, - - - - - - per lb.



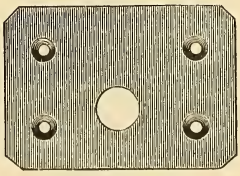
HAMMER STRAPS.

Wrought Iron, - - - - - - per lb.



DOUBLE TREE PLATES.

Wrought Iron, - - - - - - per lb.



SINGLE TREE PLATES.

Wrought Iron, - - - - - - per lb.

WAGON HARDWARE—Continued.

WAGON BOX STRAP BOLTS.

SHANK, $\frac{5}{8}$ INCH DIAMETER.

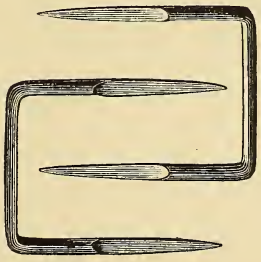
Price per Set of Eight Bolts.

12 inch,	80 cents.
14 do.	80 do.
16 do.	90 do.

Five cents for each additional inch. Other lengths made to order.

END BOARD RODS—For Wagons.

Narrow track—ready for use,	per 100 rods.
Wide do. do.	do.



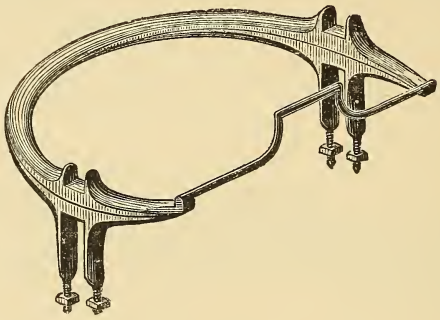
WAGON BODY STAPLES.

1½ inch,	60 cents	per doz.
2 do.	60	do.
2¼ do.	60	do.
2½ do.	60	do.

These staples are packed in half gross packages suitable for jobbing.

FIFTH WHEELS.

NEW PATTERN.



No. 1.

With Flanges for Head Block—Solid Clips of Norway Iron.

$\frac{5}{8}$	—12 to 16 in. diameter, - - - - -	$2.75 each.
$\frac{11}{16}$	—12 to 16 do. - - - - -	2.90 do.
$\frac{3}{4}$	—12 to 16 do. - - - - -	3.05 do.

Bottom wheel extends entirely round back of axle and projects about three inches front of axle, same as top wheel.

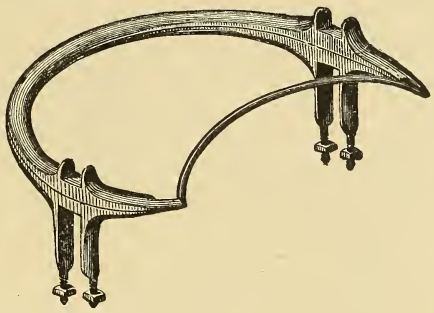
Smith's new pattern (No. 1) we deem the most desirable and durable fifth wheel in use.

This pattern, as shown in the above cut, has flanges raised on the top circle, to support the sides of the head block, which obviates the danger of its splitting at the end, as it gives a side bearing that prevents any lateral strain on the head block, and thus makes a strong, solid connection.

They are sent to market nutted and threaded, ready for use, as seen in cut, and are of the best workmanship.

N. B.—In ordering wheels, state name or style of wheel, outside diameter, size of iron and width of axle.

FIFTH WHEELS—Continued.

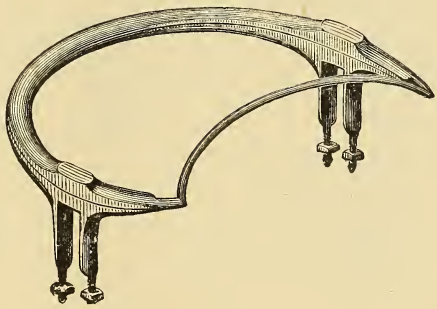


No. 2.

With Flanges for Head Block—Solid Clips of Norway Iron.

Same as No. 1 in every respect, excepting the front, and is considered a very desirable pattern.

$\frac{5}{8}$	—12 to 16 in. diameter, - - - -	$2.65 each.
$\frac{11}{16}$	—12 to 16 do. - - - - -	2.80 do.
$\frac{3}{4}$	—12 to 16 do. - - - - -	2.95 do.



No. 3.

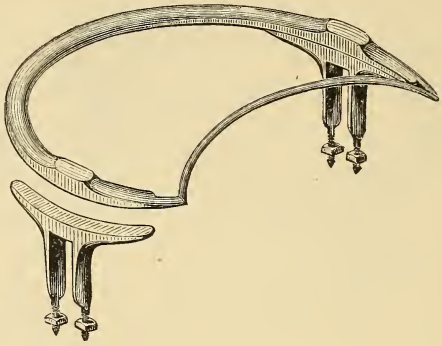
Solid Clips of Norway Iron.

Same as No. 2, excepting flanges.

$\frac{5}{8}$	iron—12 to 16 in. diameter, - - - -	$2.50 each.
$\frac{11}{16}$	do.—12 to 16 do. - - - - -	2.65 do.
$\frac{3}{4}$	do.—12 to 16 do. - - - -	2.80 do.

N. B.—In ordering wheels, state name or style of wheel, outside diameter, size of iron and width of axle.

FIFTH WHEELS — Continued.

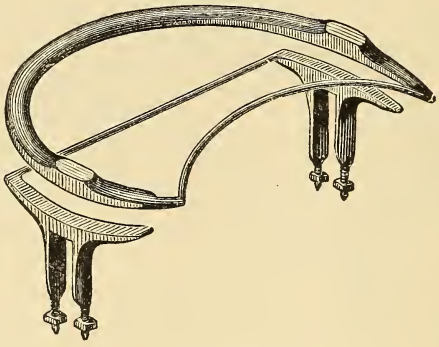


No. 4.

Solid Clips of Norway Iron.

Differs from No. 3 in that the bottom of the wheel is put on in two sections, extending about $3\frac{1}{2}$ inches back and in front of the axle.

$\frac{5}{8}$ iron—12 to 16 in. diameter,	$2.25 each.
$\frac{11}{16}$ do.—12 to 16 do.	2.40 do.
$\frac{3}{4}$ do.—12 to 16 do.	2.60 do.



No. 5.

Solid Clips of Norway Iron.

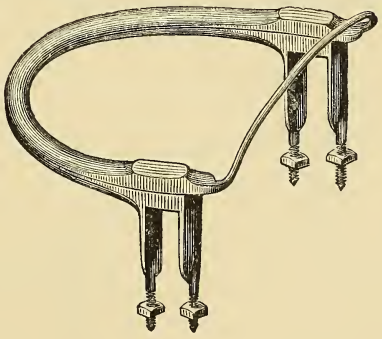
Differing from No. 4 only in having a $\frac{5}{16}$ rod connecting the back part of the bottom of the wheel, which braces and strengthens it.

$\frac{5}{8}$ iron—12 to 16 in. diameter,	$2.50 each.
$\frac{11}{16}$ do.—12 to 16 do.	2.65 do.
$\frac{3}{4}$ do.—12 to 16 do.	2.80 do.

N. B.—In ordering wheels, state name or style of wheel, outside diameter, size of iron and width of axle.

FIFTH WHEELS — Continued.

NEW YORK STYLE.



No. 6.

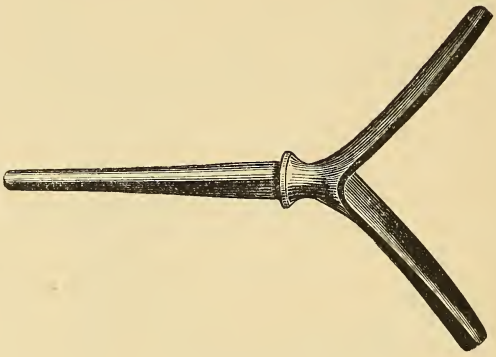
With Solid Clips of Norway Iron and Half Round Part of Ulster Iron.

$\frac{5}{8}$ iron—12 to 16 in. diameter, - - - -	$2.50 each.
$\frac{11}{16}$ do.—12 to 16 do. - - - - -	2.65 do.
$\frac{3}{4}$ do.—12 to 16 do. - - - -	2.80 do.

N. B.—In ordering wheels, state name or style of wheel, outside diameter, size of iron and width of axle.

CLIP KING BOLTS.

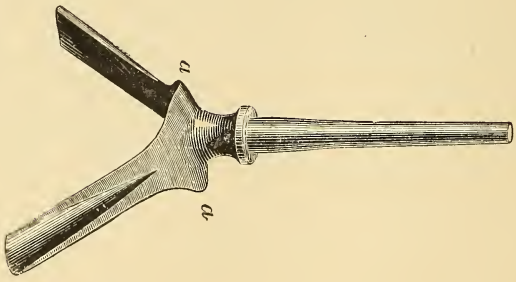
FOR BUGGIES.



PLAIN PATTERN.

MADE OF NORWAY IRON.

No. 1—Size for light buggies, - - - $4.00 per doz.
2 do. ordinary do. - - - - 4.00 do.



EXCELSIOR PATTERN.

MADE OF NORWAY IRON.

No. 1—Size for light buggies, - - - $4.00 per doz.
2— do. ordinary do. - - - - 4.00 do.

CLIP KING BOLTS—Continued.

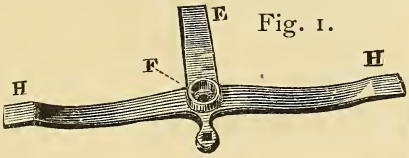


Fig. 1.

Fig. 3.

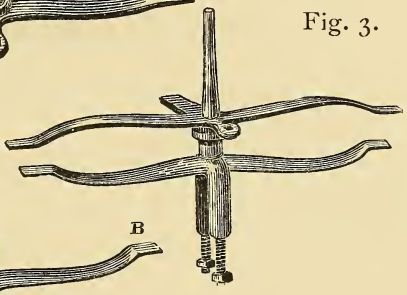
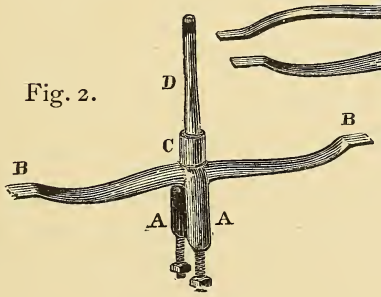


Fig. 2.



CLIP KING BOLT AND PERCH AND BED PLATE COMBINED.

$\frac{5}{8}$ wheel,	- - - - - -	$2.25 each.
$\frac{11}{16}$ do.	- - - - - - -	2.25 do.
$\frac{3}{4}$ do.	- - - - - -	2.25 do.

Fig. 1 represents the perch or head block plate inverted.

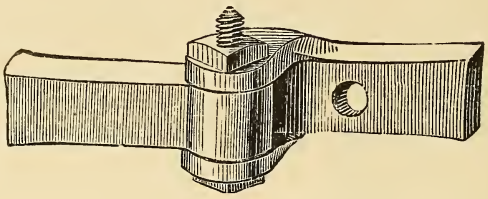
Fig. 2 represents the bed plate in an upright position.

Fig. 3 represents the plates together, as when in use.

These plates are made of the best material, and finished in the best possible manner.

N. B.—In ordering, state diameter of fifth wheel it is intended for.

SHAFT COUPLINGS.

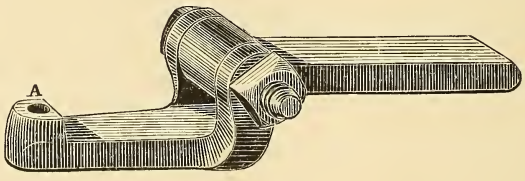


PLAIN PATTERN.

No. 1, Black —Eye, 1 inch by 1 inch,	-	$9.50 per doz. prs.
Bright—Eye, do.	- -	11.25 do.
No. 2, Black —Eye, 1 inch by $\frac{7}{8}$ inch,	-	8.75 do.
Bright—Eye, do.	- -	10.50 do.
Extra Large Black —Eye, $1\frac{1}{2}$ inch by $1\frac{1}{8}$ inch,	-	17.00 do.
Bright—Eye, do.	-	19.00 do.

The plain coupling is fastened to the carriage underneath the axle. This style is more commonly used on cheap carriages. There are three sizes of plain couplings: No. 2 is for light buggies; No. 1 for two seat carriages, and extra large for heavy rockaways and express wagons.

The above couplings all have a thread in the ear, and a $\frac{7}{16}$ inch bolt, except the extra large, which has recently been changed to $\frac{1}{2}$ inch bolt, and made throughout much heavier than formerly.

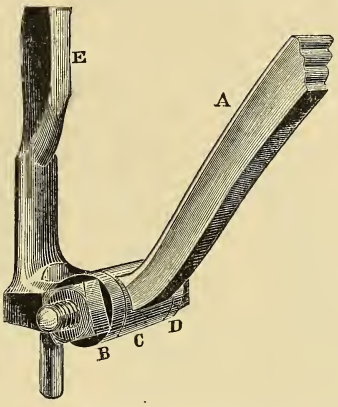


CLIP BAR PATTERN.

$1\frac{1}{8}$ Black —Eye, $1\frac{1}{8}$ inch by 1 inch,	- -	$10.50 per doz. prs.
$1\frac{1}{8}$ Bright—Eye, do.	- -	12.25 do.

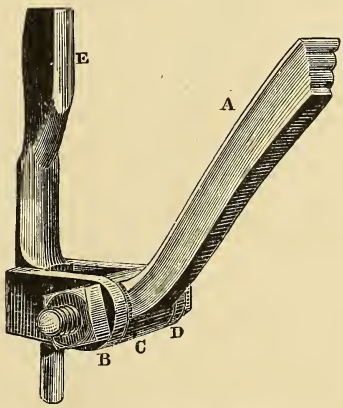
It will be seen that this pattern of coupling, by means of the clip bar attachment, does not draw on the axle clip, as does the ordinary plain pattern, but has its bearing against the axle, making a very strong coupling, at a comparatively low price for $1\frac{1}{8}$ inch.

SHAFT COUPLINGS—Continued.



IMPROVED PATTERN—With Space for Rubbers.

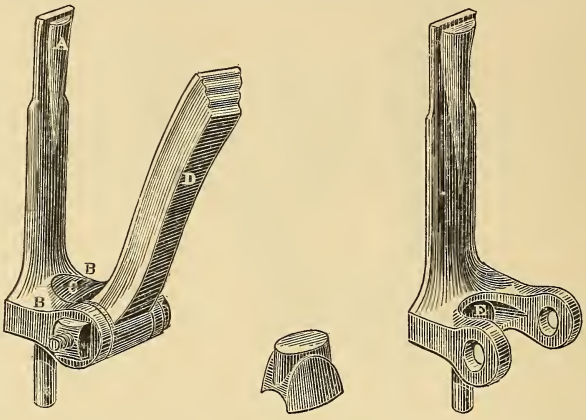
New York Pattern,	Black—Eye, 1 inch by $\frac{7}{8}$ inch,	$11.75	per doz. prs.
do.	Bright—Eye, do.	13.75	do.
Baltimore Pattern,	Black—Eye, $1\frac{1}{8}$ inch by $\frac{7}{8}$ inch,	12.50	do.
do.	Bright—Eye, do.	14.50	do.
Philadelphia, No. 1,	Black—Eye, $1\frac{1}{2}$ inch by 1 inch,	13.75	do.
do.	Bright—Eye, do.	16.25	do.
Philadelphia, No. 2,	Black—Eye, $1\frac{1}{4}$ inch by 1 inch,	13.75	do.
do.	Bright—Eye, do.	16.25	do.
Trotting Buggy,	Black—Eye, $\frac{7}{8}$ inch by $\frac{3}{4}$ inch,	11.25	do.
do.	Bright—Eye, do.	13.25	do.
Extra for square bolt in the ear,	- -	2.00	do.



STRAIGHT EAR.

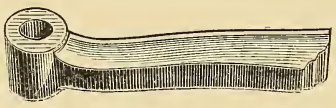
1 inch Light Bright—Eye, 1 by $\frac{3}{4}$,	- -	$13.25	per doz. prs.
1 do. Heavy do. —Eye, 1 by $\frac{7}{8}$,	- -	13.75	do.
$1\frac{1}{8}$ do. do. do. —Eye, $1\frac{1}{8}$ by $\frac{7}{8}$,	- -	14.50	do.
Extra for square bolts in the ear,	- -	2.00	do.

SHAFT COUPLINGS—Continued.



CENTRAL PARK PATTERN—With Space for Rubbers.

1 inch Light—Patent milled,	$18.00	per doz. prs.
1 do. Heavy do.	19.00	do.
Extra for square bolt in the ear,	2.00	do.



PLAIN POLE EYE.

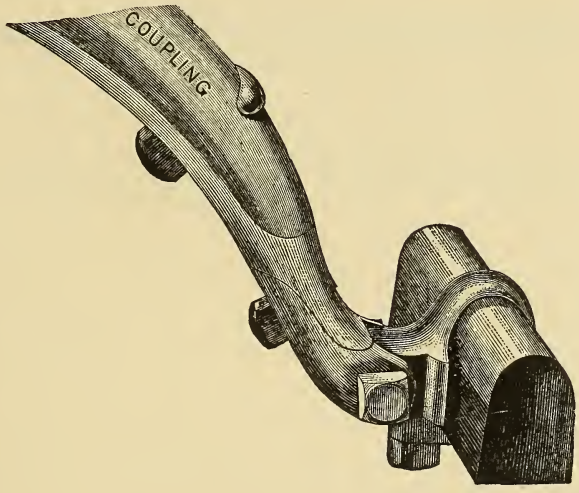
1 inch Black,	$4.25	per doz. prs.
1 do. Bright,	5.00	do.
1⅛ do. Black,	6.25	do.
1⅛ do. Bright,	7.50	do.
1¼ do. Black,	6.25	do.
1¼ do. Bright,	7.50	do.

REVERSED PATTERN POLE EYE.

⅞ inch Black,	$6.25	per doz. prs.
⅞ do. Milled,	7.25	do.
1 do. Black,	8.00	do.
1 do. Milled,	9.00	do.
1⅛ do. Black,	8.00	do.
1⅛ do. Milled,	9.00	do.
1¼ do. Black,		do.
1¼ do. Milled,		do.

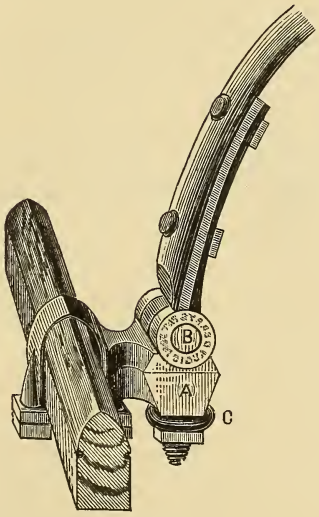
In ordering, state whether ⅜ or $\frac{7}{16}$ hole, and the kind of coupling desired to fit.

SHAFT COUPLINGS — Continued.



CLAPP'S PATENT.

Bright finished, - - - - $18.00 per doz. prs.
Pole Eyes, - - - - - 13.00 do.



DERBY'S PATENT.

Bright finished, - - - - $23.00 per doz. prs.
Pole Eyes, - - - - - 11.50 do.

AXLE CLIPS.

SUPERIOR CARRIAGE CLIPS.

No. 0—	Flat part,	2½	inches long,	-	-	70	cents	per	doz.
1—	do.	3	do.	-	-	-	70	do.	do.
2—	do.	3½	do.	-	-	70	do.	do.
3—	do.	4	do.	-	-	-	78	do.	do.
4—	do.	4½	do.	-	-	97	do.	do.
5—	do.	5	do.	-	-	$1.20		do.
6—	do.	6	do.	-	-	1.50		do.
7—	do.	6½	do.	-	-			do.

No. 7 is designed for heavy wagons, being extra heavy.

These superior clips are made of round iron, and the shank or round part is $\frac{5}{16}$ inch in diameter, except Nos. 4, 5 and 6, which are $\frac{3}{8}$ inch in diameter. The flat part is trimmed so as to require no filing, and is $\frac{7}{8}$ in. wide.

NORWAY IRON.

No. 0—	Flat part,	2½	inches long,	-	-	80	cents	per	doz.
1—	do.	3	do.	-	-	-	80	do.	do.
2—	do.	3½	do.	-	-	80	do.	do.
3—	do.	4	do.	-	-	-	88	do.	do.
4—	do.	4½	do.	-	-	$1.12		do.
5—	do.	5	do.	-	-	-	1.35		do.

These clips are all drawn from slit rods $\frac{5}{8}$ by $\frac{1}{4}$ inch. This size of iron gives plenty of stock to make the clip heavy at the place where the flat part joins the round part or shank. Each clip is drawn thin in the centre of the flat part, where it is bent over the top of the axle, and increases regularly in size to the shank, where it is so well proportioned that it never twists off, which is a common fault with other clips. The nuts are made to fit snugly, so that they can barely be turned with the fingers, and the thread on the shank is cut of a uniform size all the way up. The nuts are the same as are used on the Philadelphia Bolt, and they are cut with a plug tap, so that every thread in the nut bears an equal amount of strain, and it is almost impossible to strip the threads. Each clip is finished, and ready to put on the carriage without filing.

AXLE CLIPS—Continued.

SMITH'S NEW STYLE CARRIAGE CLIPS.

For Light Buggies.

No. 0—	Flat part,	$2\frac{1}{2}$	inches long,	-	-	80	cents	per	doz.
1—	do.	3	do.	-	-	80	do.	do.
2—	do.	$3\frac{1}{2}$	do.	-	-	80	do.	do.
3—	do.	4	do.	-	-	88	do.	do.

These clips are designed exclusively for light buggies, and are made in same manner and style as clips described on preceding page, except that the flat part is $\frac{5}{8}$ of an inch wide, and the round part or shank $\frac{1}{4}$ of an inch in size.

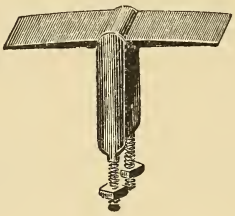
SPRING BAR CLIPS.

SIZE OF SHANK, $\frac{5}{16}$ INCH.

With Bead in Centre.

No. 0—	$\frac{5}{8}$	in. wide;	centre,	4	inches long,	-	$1.00	per	doz.
1—	$\frac{5}{8}$	do.	do.	$4\frac{3}{4}$	do.	-	1.15	do.
2—	$\frac{5}{8}$	do.	do.	$5\frac{1}{4}$	do.	-	1.22	do.
3—	$\frac{5}{8}$	do.	do.	$5\frac{3}{4}$	do.	-	1.30	do.
4—	$\frac{5}{8}$	do.	do.	$6\frac{3}{8}$	do.	-	1.45	do.
5—	$\frac{5}{8}$	do.	do.	7	do.	-	1.65	do.

SADDLE CLIPS.

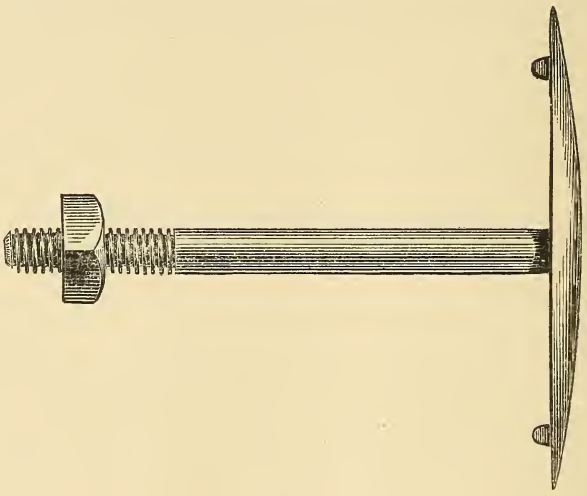


BREWSTER & CO.'S PATENT.

Clips for	1¼ in. springs,	$6.00	per doz.
do.	1½ do.	6.00	do.
do.	1¾ do.	6.00	do.

The above clips make a very strong, solid connection of the spring and axle, doing away entirely with the use of bolts through the axle—giving the same a better and more highly finished appearance. Used for double perched carriages, and made of Norway Iron.

WHIFFLETREE BOLTS.



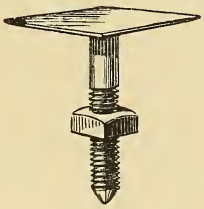
HALF OVAL T HEAD—With Spurs.

5/16 in. diameter,	3½ in. long,	$3.00	per doz.
⅜ do.	3½ do.	3.00	do.

Made of Norway Iron, and put up in paper boxes of 4 dozen each. Extra lengths to order.

BOLTS.

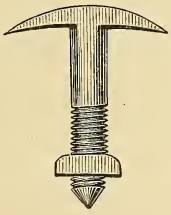
SHAFT—DIAMOND HEAD.



NORWAY IRON.

1 inch × $\frac{3}{16}$ and $\frac{1}{4}$,	- - - - -	$3.90 per 100.
1$\frac{1}{4}$ do.	do. - - - - -	4.05 do.
1$\frac{1}{2}$ do.	do. - - - - -	4.20 do.
1$\frac{3}{4}$ do.	do. - - - - -	4.35 do.
2 do.	do. - - - - -	4.50 do.

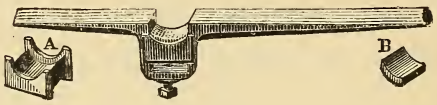
SHAFT—T HEAD.



NORWAY IRON.

1 inch × $\frac{3}{16}$ and $\frac{1}{4}$,	- - - - -	$2.80 per 100.
1$\frac{1}{4}$ do.	do. - - - - -	2.95 do.
1$\frac{1}{2}$ do.	do. - - - - -	3.10 do.
1$\frac{3}{4}$ do.	do. - - - - -	3.25 do.
2 do.	do. - - - - -	3.40 do.
2$\frac{1}{4}$ do.	do. - - - - -	3.55 do.
2$\frac{1}{2}$ do.	do. - - - - -	3.70 do.

FIFTH WHEEL ANTI-RATTLERS.



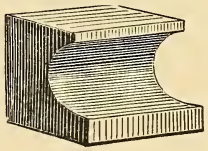
$\frac{5}{8}$ Fifth wheels,	- - - - -	$5.00 per doz.
$\frac{11}{16}$ do.	- - - - - -	5.00 do.
$\frac{3}{4}$ do.	- - - - -	5.00 do.

The above engraving shows this very useful little invention, ready for use.

The bed, A, which receives the rubber packing, B, can be operated by the set screw, as shown above, and made to tighten the packing, B, around the bottom circle of the fifth wheel.

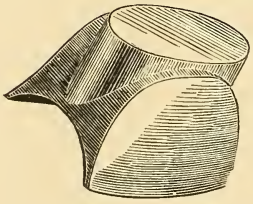
It can be used on all fifth wheels, excepting Nos. 4 and 5.

N. B.—In ordering, state size of fifth wheel intended for.



SHAFT RUBBERS.

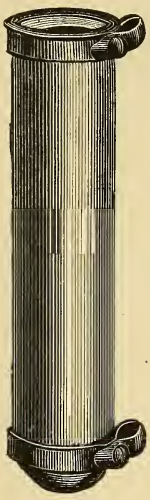
$\frac{3}{4}$ inch, 1 do. $1\frac{1}{8}$ do.	- - - - -	$1.50 per doz. prs.



CENTRAL PARK SHAFT RUBBERS.

1 inch Light—Central Park pattern,	- -	$1.50 per doz. prs.
1 do. Heavy	do. - -	1.50 do.
$1\frac{1}{8}$ do.	do. - -	1.75 do.

WHIP SOCKETS.



JAPANNED.

Chamberlin's Patent Clamp Sockets, - - $6.00 per doz.

N. B.—These are considered by all carriage and wagon-makers the best in use; the top and bottom are made of malleable iron, which gives the socket great durability. The clamps are such that they can be easily attached to any dash firmly, and at such a distance from it, that the whip does not mar the dash leather.

SPRING BUFFERS.

Rubber, - - - - - - per ℔.

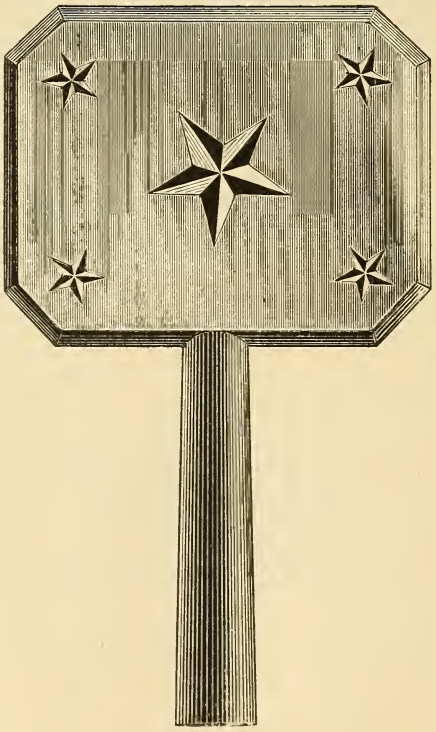
FELLOE PLATES.

PHILADELPHIA PATTERN—Wrought Iron.

Plates for	$\frac{7}{8}$	rims,	per ℔.
do.	1	do.	do.
do.	$1\frac{1}{8}$	do.	do.
do.	$1\frac{1}{4}$	do.	do.
do.	$1\frac{3}{8}$	do.	do.
do.	$1\frac{1}{2}$	do.	do.
do.	$1\frac{5}{8}$	do.	do.
do.	$1\frac{3}{4}$	do.	do.
do.	2	do.	do.

These plates are made of a superior quality of iron, and put up in paper boxes holding 10 ℔s. each, and labeled.

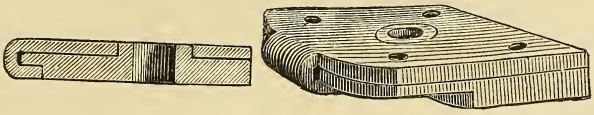
STEP PADS.



Wrought iron, - - - - $12.00 per doz. prs.

WHIFFLETREE PLATES.

Fig. 1. Fig. 2.



BREWSTER & CO.'S PATENT.

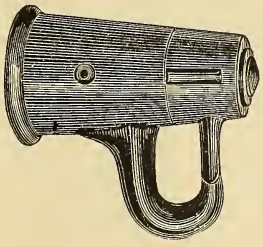
No. 1—For light buggies, - - - - $3.00 per doz.
2—For heavier carriages, - - - - 3.40 do.

Fig. 1 represents a section of the plates parallel with the shaft.
Fig. 2 represents the plates locked together.

These plates are made and finished in a superior manner. The upper plate, with hook, is made of Norway iron, bottom of malleable.

Packed in boxes of 4 dozen sets each.

WHIFFLETREE HOOKS.



⅞ inch, - - - - - -	$5.00 per doz.	prs.
1 do. - - - - - -	5.00	do.
1⅛ do. - - - - - -	5.75	do.
1¼ do. - - - - - -	6.50	do.
1⅜ do. - - - - - -	7.50	do.
1½ do. - - - - - -	8.50	do.

Made of malleable iron, japanned and varnished.

MALLEABLE IRON CASTINGS.

WHIFFLETREE FERRULES.

ROUND.

No. 0—	½ inch at small end,	- - - -	37 to the lb.
1—	⅝ do.	do. - - - -	24 do.
2—	¾ do.	do. - - - -	17 do.
3—	⅞ do.	do. - - - -	13 do.
4—	1 do.	do. - - - -	9 do.
5—	1⅛ do.	do. - - - -	8 do.
6—	1¼ do.	do. - - - -	7 do.
7—	1⅜ do.	do. - - - -	6 do.
8—	1½ do.	do. - - - -	5 do.
9—	1⅝ do.	do. - - - -	4 do.
10—	1¾ do.	do. - - - -	3½ do.
11—	2 do.	do. - - - -	2½ do.

CLOSE END.

No. 12—	¾ inch at small end,	⅞ inch at large end, -	11 to the lb.
13—	⅞ do.	do. 1 do. do. -	8 do.
14—	1 do.	do. 1⅛ do. do. -	7 do.

MALLEABLE IRON CASTINGS—Continued.

WHIFFLETREE TONGUES.

PLAIN SHANK WITH SHOULDER.

No. 15—2¾ inches long, ⅜ shank, - - - 13 to the lb.
16—3 do. 7/16 do. - - - 9 do.

SCREW SHANK WITH SHOULDER.

No. 17—2¾ inches long, ⅜ shank, - - - 14 to the lb.
18—3 do. 7/16 do. - - - 12 do.

PLAIN WITHOUT SHOULDER.

No. 19—3⅜ inches long, ⅜ shank, - - - 9 to the lb.

WITH SOCKET.

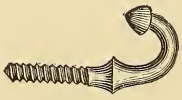
No. 20—4½ inches long, ⅞ in. at large end, - - weight, 6¼ oz.

MALLEABLE IRON CASTINGS—Continued.

WHIFFLETREE HOOKS.

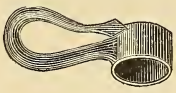
PLAIN SHANK.

No. 21—3 inches long, - - - - - 8 to the ℔.

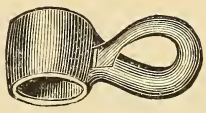


SCREW SHANK.

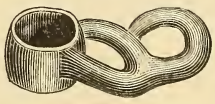
No. 22—3 inches long, - - - - 10 to the ℔.



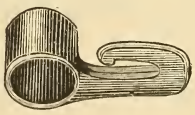
No. 23—1¼ inch hole at small end, - - 1 ℔. per pair.
24—1½ do. do. - - - 1 ℔. 5 oz. do.



No. 25—1 inch hole at small end, - - - 8 oz. per pair.
26—1⅛ do. do. - - - 11 oz. do.
27—1½ do. do. - - - 18½ oz. do.



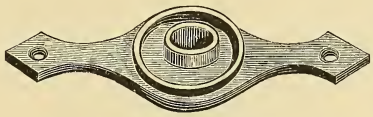
No. 28—1⅛ inch hole at small end, - - 17 oz. per pair.



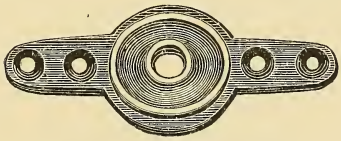
No. 29—1¼ inch hole at small end, - - 13½ oz. per pair.

MALLEABLE IRON CASTINGS — Continued.

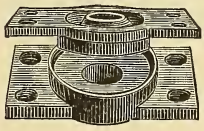
WHIFFLETREE CIRCLES — In Pairs.



No. 30—1½ inch ring, 4 inches long, - - 5 pairs to the lb.



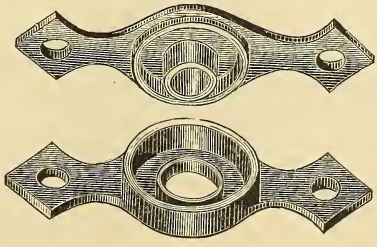
No. 31—2 inch ring, 4½ inches long, - - 3 pairs to the lb.
32—2¼ do. 5¼ do. - - - 1 pair to 10 oz.



NEW PATTERN.

No. 33—1⅜ inches wide, 2⅜ inches long, - - 4 oz. per pair.

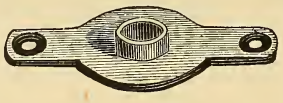
These are designed especially for light work, and are fitted to receive a leather washer to prevent rattling.



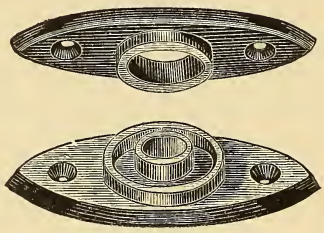
No. 34—1½ inch ring, 4 inches long, - - 4 oz. per pair.

MALLEABLE IRON CASTINGS—Continued.

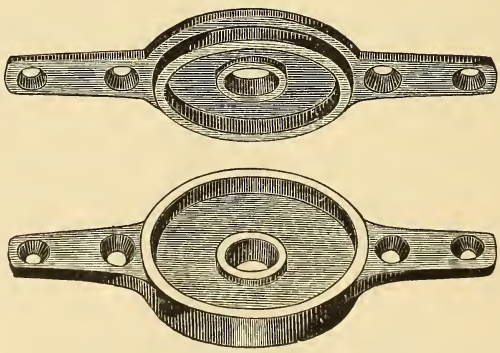
WHIFFLETREE CIRCLES—Continued.



No. 35—1¾ inch ring, 3⅜ inches long, - - 4 pairs to the ℔.
36—2½ do. 3¾ do. - - 2 do.



No. 37—1⅜ inch ring, 3⅜ inches long, - - 4½ oz. per pair.



No. 38—2⅝ inch ring, 6¼ inches long, for heavy work, - 12 oz. per pair.

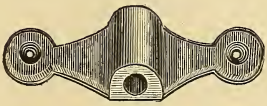
MALLEABLE IRON CASTINGS—Continued.

WHIFFLETREE PLATES.

No. 39—3¼ inches long, - - - - 23 to the lb.

No. 40—3 inches long, - - - 9 to the lb.

No. 41—4 inches long, - - - - 13 to the lb.



No. 42—3⅞ inches long, - - - - 6 to the lb.

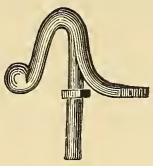
No. 43—5 inches long, - - - - 12 to the lb.

MALLEABLE IRON CASTINGS—Continued.

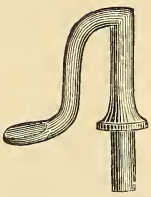
HOLD BACKS.

No. 44—4½ inches long, - - - - - 8 to the lb.

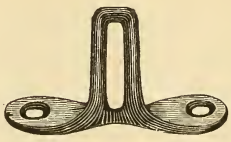
No. 45—5½ inches long, - - - - 6 to the lb.
No. 46—6¼ inches long, - - - - - 4 do.



No. 47—3 inches long, - - - - 10 to the lb.
48—3¼ do. - - - - - 8 do.
49—3¾ do. - - - - 4½ do.



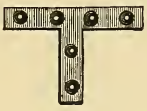
No. 50—1⅝ inches long from staple to bolt hole, - 7 to the lb.



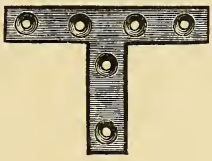
No. 51— ⅞ inch loop, - - - - 10 to the lb.
52—1 do. - - - - - 7 do.
53—1⅛ do. - - - - 6 do.
54—1¼ do. - - - - - 5 do.

MALLEABLE IRON CASTINGS—Continued.

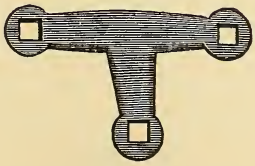
TEE IRONS.



No. 55—3 in. wide, 2⅛ in. high; width, ⅝ in. - - 12 to the ℔.
56—3⅜ do. 2½ do. do. ¾ do. - 8 do.
57—3¾ do. 2¾ do. do. ¾ do. - - 6½ do.



No. 58—4¼ in. wide, 3 in. high; width, ⅞ in. - 5½ to the ℔.

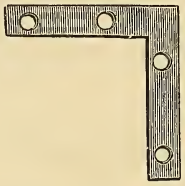


RIGHT AND LEFT.

No. 59—4¼ in. wide, 2½ in. high; width, ¾ in. - 8 to the ℔.

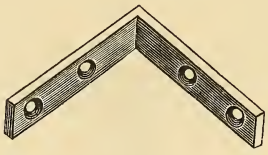
MALLEABLE IRON CASTINGS—Continued.

CORNER IRONS.



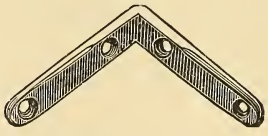
MEASURES TAKEN OUTSIDE.

No. 60—	$1\frac{5}{8}$ in. long,	$\frac{7}{16}$ in. wide,	33	to the lb.
61—	$2\frac{1}{4}$ do.	$\frac{5}{8}$ do.	16	do.
62—	$2\frac{3}{4}$ do.	$\frac{5}{8}$ do.	10	do.
63—	$2\frac{3}{4}$ do.	$\frac{1}{2}$ do.	11	do.
64—	$3\frac{1}{2}$ do.	$\frac{3}{4}$ do.	6	do.
65—	4 do.	$\frac{3}{4}$ do.	$4\frac{1}{2}$	do.



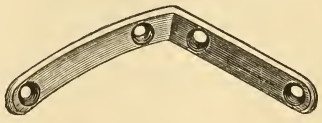
INSIDE SQUARE CORNERS.

No. 66—$2\frac{3}{4}$ in. long, $\frac{9}{16}$ in. wide, - - - 10 to the lb.



BEVEL CORNERS—Right and Left.

No. 67—$2\frac{3}{4}$ in. long, $\frac{9}{16}$ in. wide, - - - 14 to the lb.

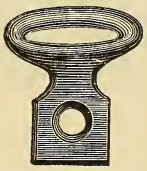


BEVEL CORNERS—Right and Left.

No. 68—$3\frac{1}{4}$ in. long, $\frac{9}{16}$ in. wide, - - - 7 to the lb.

MALLEABLE IRON CASTINGS—Continued.

SHAFT BODY AND PERCH LOOPS.



SHAFT LOOP.

No. 69—$\frac{7}{8}$ in. loop, - - - - - 25 to the lb.

SHAFT LOOP.

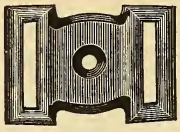
No. 70—$\frac{7}{8}$ in. loop, - - - - - 18 to the lb.

BODY LOOP.

No. 71—1 in. loop, - - - - - 11 to the lb.
72—1$\frac{1}{8}$ do. - - - - - 7 do.
73—1$\frac{1}{4}$ do. - - - - - 6 do.
74—1$\frac{1}{2}$ do. - - - - - 5 do.

MALLEABLE IRON CASTINGS—Continued.

SHAFT BODY AND PERCH LOOPS—Continued.



CHECK OR PERCH LOOP.

No. 75—	1 in. loop,	2¼ in. long,	9	to the lb.
76—	1⅛ do.	3¼ do.	8	do.
77—	1⅛ do.	2¼ do.	6	do.
78—	1¼ do.	3¾ do.	5	do.
79—	1½ do.	3¾ do.	3½	do.

FOOTMAN'S LOOP.

No. 80—	1 in. loop,	26	to the lb.
81—	1¼ do.	14	do.
82—	1⅜ do.	13	do.
83—	1½ do.	13	do.
84—	1⅝ do.	12	do.
85—	1¾ do.	12	do.
86—	2½ do.	8	do.

MALLEABLE IRON CASTINGS—Continued.

AXLE CLIPS.

LIGHT.

No. 87—For	$\frac{7}{8}$	inch axle,	13 to the lb.
88—For	1	do.	$12\frac{1}{2}$ do.
89—For	$1\frac{1}{8}$	do.	$10\frac{1}{2}$ do.
90—For	$1\frac{1}{4}$	do.	11 do.
91—For	$1\frac{3}{8}$	do.	11 do.
92—For	$1\frac{1}{2}$	do.	$10\frac{1}{2}$ do.

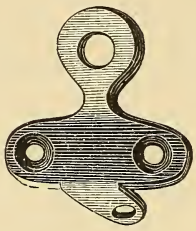
HEAVY.

No. 93—For	$\frac{7}{8}$	inch axle,	7 to the lb.
94—For	1	do.	6 do.
95—For	$1\frac{1}{8}$	do.	$5\frac{1}{2}$ do.
96—For	$1\frac{1}{4}$	do.	5 do.
97—For	$1\frac{3}{8}$	do.	5 do.
98—For	$1\frac{1}{2}$	do.	5 do.

AXLE CLIP & SHAFT COUPLING COMBINED.

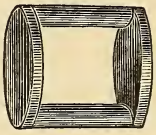
No. 99—For	$\frac{7}{8}$	inch axle,	10 oz. per pair.
100—For	1	do.	11 oz. do.
101—For	$1\frac{1}{8}$	do.	$11\frac{1}{4}$ oz. do.
102—For	$1\frac{1}{4}$	do.	$11\frac{1}{2}$ oz. do.
103—For	$1\frac{3}{8}$	do.	$11\frac{1}{2}$ oz. do.
104—For	$1\frac{1}{2}$	do.	12 oz. do.

MALLEABLE IRON CASTINGS—Continued.



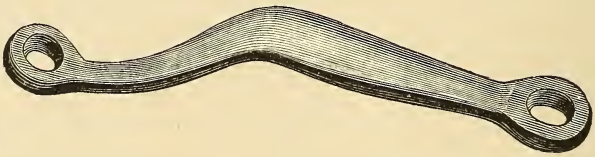
SHIFTING RAIL IRON.

No. 105—For sliding seats in carriages, - - 13 to the ℔.



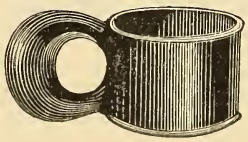
SPRING SHACKLES.

No. 106—1¼ inches, - - - - - 5 ounces.
107—1½ do. - - - - - - 6½ do.
108—1¾ do. - - - - - 8 do.



WAGON HAMMER STRAPS.

No. 109— 8 inches long, - - - - - ounces.
110— 7½ do. - - - - - - 8 do.
111—10½ do. - - - - 13 do.

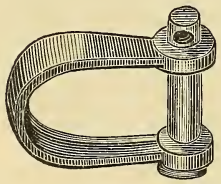


DOUBLE AND SINGLE TREE CENTRE IRONS.

No. 112—2¼ inch hole, - - - - 29 oz. per pair.
113—2⅜ do. - - - - - 32 oz. do.
114—2½ do. - - - - 33½ oz. do.

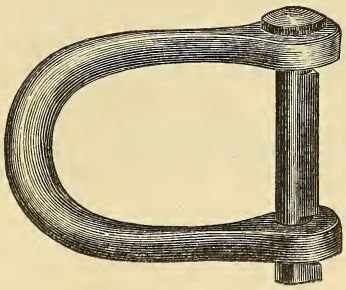
MALLEABLE IRON CASTINGS—Continued.

CLEVISES.



DOUBLE TREE.

No. 115—For 1⅝ inch double tree, - - - 13 ounces.



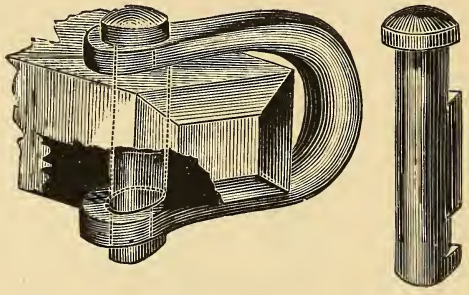
SHOVEL PLOW.

No. 116—For 2⅝ inch beam, - - - - 17 ounces.

For manner of using the pins, see page 216.

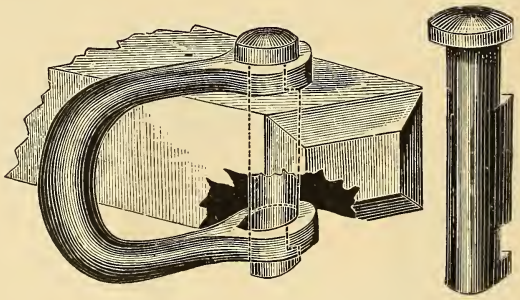
MALLEABLE IRON CASTINGS—Continued.

CLEVISES—Continued.



WITH SELF-ADJUSTING PIN.

No. 117—Weight, - - - - - 16½ ounces.



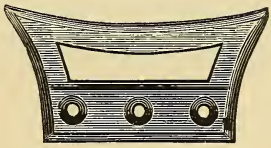
No. 118—Weight, - - - - - 19¼ ounces.

View No. 117 shows the clevis in position on the double tree to receive the pin, and the pin at the side shows its shape and position when in the wood, as also shown by the dotted lines. After having been adjusted as above, the clevis is then turned around to the front in line of draft, as shown in View No. 118, while the pin remains in its first position, as shown by the pin at the side of Views Nos. 117 and 118, as also by dotted lines in View No. 118. Being so held by the wood, the hole for pin being so fitted to shape of the pin, to prevent its turning in the wood when the clevis turns, and thus fastening the pin by the small point, or projection on bottom of pin, as long as the clevis is in line of draft, and until turned back to first position, as in View No. 117.

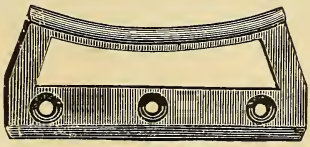
MALLEABLE IRON CASTINGS—Continued.

WEAR IRONS.

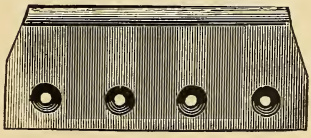
No. 119—2½ in. long, - - - - - 2¾ ounces.
120—4¼ do. - - - - - 3½ do.
121—5 do. - - - - - 4 do.
122—6 do. - - - - - 5½ do.



No. 123—4 in. long, - - - - - 4 ounces.
124—5 do. - - - - - 5 do.



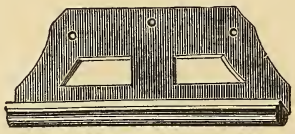
No. 125—4½ in. long, - - - - - 6¼ ounces.
126—6 do. - - - - - 8¾ do.



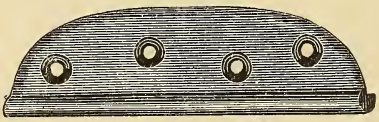
No. 127—5 in. long, - - - - - 8 ounces.
128—6½ do. - - - - - 10 do.

MALLEABLE IRON CASTINGS—Continued.

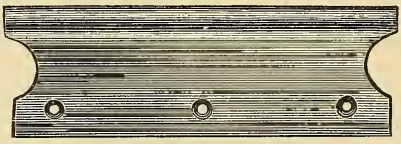
WEAR IRONS—Continued.



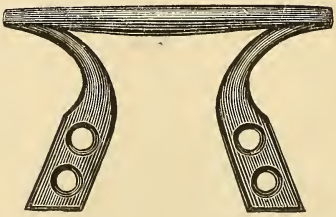
No. 129—5½ in. long, - - - - - 8½ ounces.



No. 130—6½ in. long, - - - - - 12½ ounces.



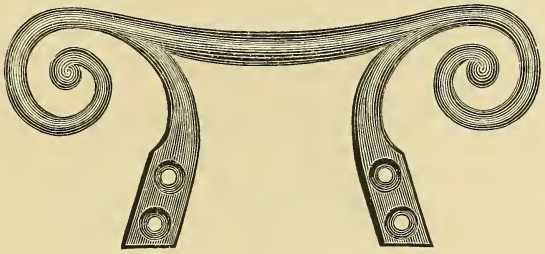
No. 131—6½ in. long, - - - - - 10¼ ounces.



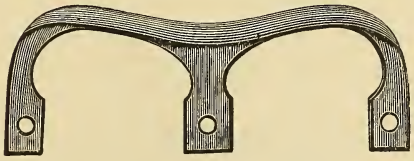
No. 132—3¾ in. long, - - - - - 3¾ ounces.
133—5 do. - - - - - 7¼ do.
134—6 do. - - - - - 9 do.

MALLEABLE IRON CASTINGS—Continued.

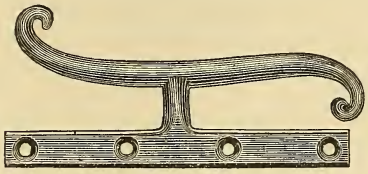
WEAR IRONS—Continued.



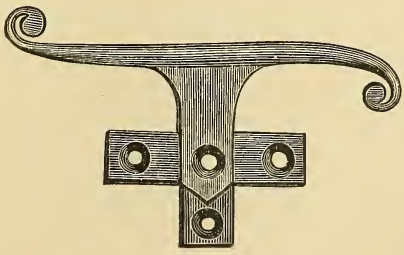
No. 135—8½ in. long, - - - - - 12 ounces.



No. 136—6¾ in. long, - - - - - 6½ ounces.



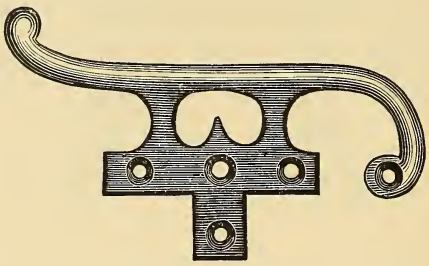
No. 137—5 in. long, - - - - - 5¾ ounces.



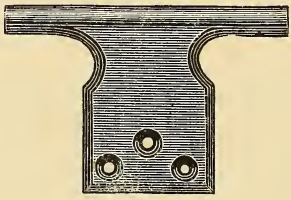
No. 138—6½ in. long, - - - - - 8¾ ounces.

MALLEABLE IRON CASTINGS—Continued.

WEAR IRONS—Continued.



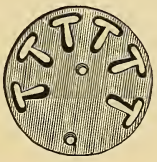
No. 139—7 in. long, - - - - - 8½ ounces.



No. 140—4½ in. long, - - - - - 6 ounces.

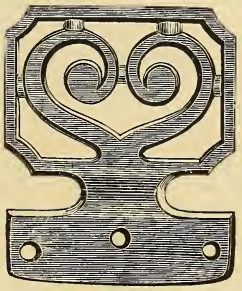
MALLEABLE IRON CASTINGS—Continued.

CARRIAGE STEPS.

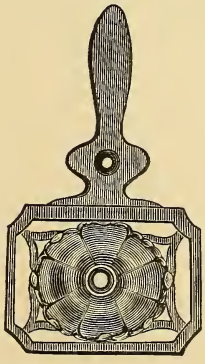


STEP PLATE.

No. 141—$3\frac{3}{4}$ in. diameter, - - - - $5\frac{1}{2}$ ounces.
142—4 do. - - - - - 6 do.



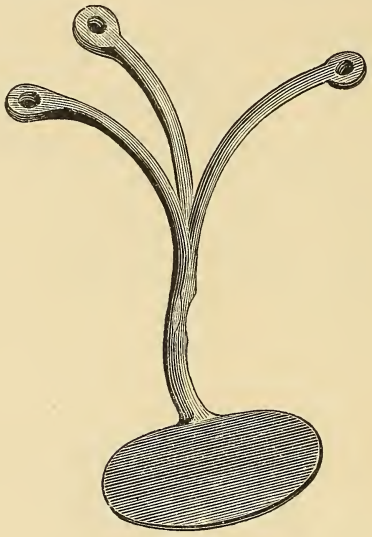
No. 143—Weight, - - - - - $13\frac{1}{2}$ ounces.



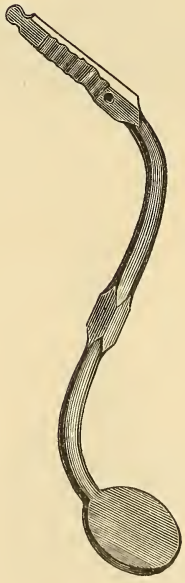
No. 144—Weight, - - - - - 10 ounces.

MALLEABLE IRON CASTINGS—Continued.

CARRIAGE STEPS—Continued.



No. 145—Weight, - - - - - 27 ounces.

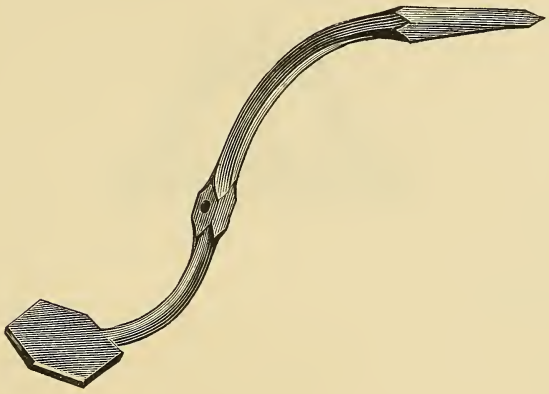


SIDE SPRING—Right and Left.

No. 146—Weight, - - - - - 49 ounces.

MALLEABLE IRON CASTINGS—Continued.

CARRIAGE STEPS—Continued.



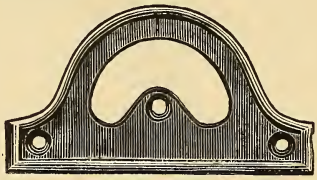
SIDE SPRING—Right and Left.

No. 147—Weight, - - - - - 49 ounces.

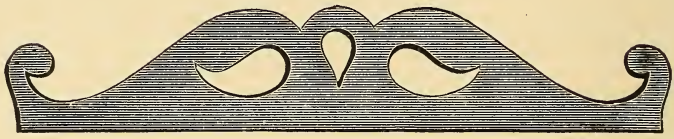
No. 148—Weight, - - - - - 34½ ounces.

MALLEABLE IRON CASTINGS—Continued.

SLEIGH STEPS.



No. 149—Weight, - - - - - 4½ ounces.



DOUBLE.

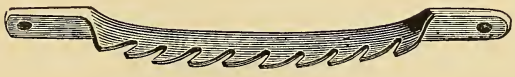
No. 150—Weight, - - - - - 42½ ounces.

MALLEABLE IRON CASTINGS — Continued.

THUMB NUTS.

No. 151—$\frac{3}{16}$ inch hole, $\frac{3}{16}$ inch thick, - - 66 to the lb.
152—$\frac{3}{16}$ do. $\frac{1}{4}$ do. - - - 43 do.
153—$\frac{3}{16}$ do. $\frac{7}{16}$ do. - - 20 do.
154—$\frac{5}{16}$ do. $\frac{7}{16}$ do. - - - 22 do.
155—$\frac{5}{16}$ do. $\frac{1}{2}$ do. - - 15 do.
156—$\frac{5}{16}$ do. $\frac{9}{16}$ do. - - - 11 do.
157—$\frac{3}{8}$ do. $\frac{1}{2}$ do. - - - 10 do.
158—$\frac{7}{16}$ do. $\frac{13}{16}$ do. - - $2\frac{1}{2}$ do.

No. 159—$\frac{5}{16}$ inch hole, $\frac{3}{16}$ inch thick, - - 31 to the lb.
160—$\frac{3}{8}$ do. $\frac{1}{4}$ do. - - - 20 do.



BRAKE HOLDER.

No. 161—17 inches long; weight, - - - $27\frac{1}{2}$ ounces.

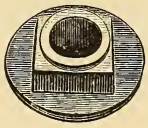
MALLEABLE IRON CASTINGS—Continued.

AXLE NUTS.

FOR WOOD AXLES.

Measure taken inside of hole at top and outside of nut.

No. 162—	$\frac{1}{2}$	inch hole,	$2\frac{1}{8}$	inch flange,	1	inch nut.
163—	$\frac{5}{8}$	do.	$2\frac{1}{4}$	do.	1	do.
164—	$\frac{3}{4}$	do.	$2\frac{5}{16}$	do.	1	do.
165—	$\frac{3}{4}$	do.	$2\frac{7}{8}$	do.	$1\frac{1}{4}$	do.
166—	$\frac{13}{16}$	do.	$3\frac{1}{4}$	do.	$1\frac{5}{16}$	do.
167—	$\frac{7}{8}$	do.	$3\frac{1}{8}$	do.	$1\frac{1}{2}$	do.
168—	1	do.	$3\frac{1}{8}$	do.	$1\frac{5}{8}$	do.



FOR IRON AXLES.

No. 169—	$\frac{1}{2}$	inch hole,	$1\frac{7}{8}$	inch flange,	1	inch nut.
170—	$\frac{11}{16}$	do.	2	do.	$1\frac{1}{8}$	do.
171—	$\frac{13}{16}$	do.	$2\frac{1}{4}$	do.	$1\frac{1}{4}$	do.
172—	$\frac{7}{8}$	do.	$2\frac{1}{2}$	do.	$1\frac{3}{8}$	do.
173—	$\frac{15}{16}$	do.	$2\frac{3}{4}$	do.	$1\frac{1}{2}$	do.
174—	$1\frac{1}{8}$	do.	$3\frac{5}{16}$	do.	$2\frac{1}{16}$	do.
175—	$1\frac{1}{4}$	do.	$3\frac{3}{4}$	do.	$2\frac{1}{16}$	do.
176—	$1\frac{3}{8}$	do.	4	do.	$2\frac{1}{4}$	do.

MALLEABLE IRON CASTINGS—Continued.

END BOARD NUTS.

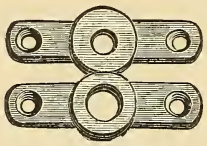
No. 177—For $\frac{3}{8}$ inch rod; weight, - - - $2\frac{3}{4}$ ounces.

No. 178—For $\frac{3}{8}$ inch rod; weight, - - - 4 ounces.

No. 179—For $\frac{3}{8}$ inch rod; weight, - - - $6\frac{1}{4}$ ounces.

MALLEABLE IRON CASTINGS—Continued.

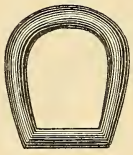
END BOARD ROD WASHERS.



No. 180—For $\frac{5}{16}$ inch rod, - - - 7 sets to the ℔.
181—For $\frac{3}{8}$ do. - - - - 5 do.
182—For $\frac{3}{8}$ do. - - - 3 do.

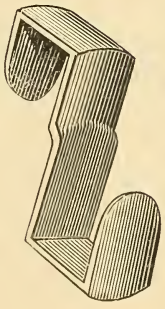
No. 182 has square ends.

D STAKE RINGS.



No. 183—$1\frac{3}{8}$ inch by $1\frac{5}{8}$ inch, - - - 8 to the ℔.
184—$1\frac{5}{8}$ do. 2 do. - - - 7 do.

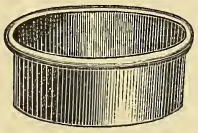
WAGON BOX SPRING IRON.



No. 185—$3\frac{1}{2}$ inches long, $1\frac{1}{8}$ and $1\frac{3}{8}$ inch hooks inside.

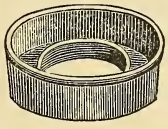
MALLEABLE IRON CASTINGS—Continued.

HUB BANDS.



OPEN END.

No. 186—Light pattern, from $\frac{15}{16}$ to $1\frac{1}{2}$ in. deep; diameter, $2\frac{3}{8}$ inches.
187— do. do. do. do. $2\frac{3}{4}$ do.
188— do. do. do. do. $2\frac{7}{8}$ do.
189— do. do. do. do. $3\frac{1}{4}$ do.
190— do. do. do. do. $3\frac{3}{8}$ do.
191— do. from $1\frac{7}{16}$ to $1\frac{7}{8}$ in. deep; do. $2\frac{1}{2}$ do.
192— do. do. do. do. $2\frac{5}{8}$ do.
193— do. do. do. do. $2\frac{3}{4}$ do.
194— do. do. do. do. 3 do.
195— do. do. do. do. $3\frac{1}{4}$ do.
196— do. do. do. do. $3\frac{5}{8}$ do.
197— do. do. do. do. $3\frac{3}{4}$ do.
198— do. do. do. do. $3\frac{7}{8}$ do.
199— do. do. do. do. 4 do.
200—Heavy pattern, from $1\frac{1}{4}$ to $1\frac{7}{8}$ in. deep; do. $2\frac{3}{4}$ do.
201— do. do. do. do. $2\frac{7}{8}$ do.
202— do. do. do. do. $3\frac{1}{8}$ do.
203— do. do. do. do. $3\frac{1}{4}$ do.
204— do. do. do. do. $3\frac{1}{2}$ do.
205— do. do. do. do. $4\frac{1}{4}$ do.

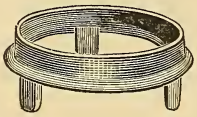


CLOSE END.

No. 206—From $1\frac{3}{8}$ to $1\frac{5}{8}$ in deep; diameter, - - 3 inches.
207— do. do. do. - - $3\frac{1}{8}$ do.
208— do. do. do. - - $3\frac{1}{4}$ do.
209— do. do. do. - - $3\frac{1}{2}$ do.
210— do. do. do. - - $3\frac{5}{8}$ do.
211— do. do. do. - - $3\frac{3}{4}$ do.
212— do. do. do. - - 4 do.
213— do. do. do. - - $4\frac{1}{8}$ do.
214— do. do. do. - - $4\frac{1}{4}$ do.

MALLEABLE IRON CASTINGS—Continued.

SAND BANDS.



TO DRIVE.

No. 215—	Diameter,	$2\frac{1}{2}$ inches.
216—	do.	$2\frac{3}{4}$ do.
217—	do.	3 do.
218—	do.	$3\frac{1}{4}$ do.
219—	do.	$3\frac{1}{2}$ do.
220—	do.	$3\frac{3}{4}$ do.
221—	do.	4 do.
222—	do.	$4\frac{1}{4}$ do.
223—	do.	$4\frac{1}{2}$ do.

TO SCREW.

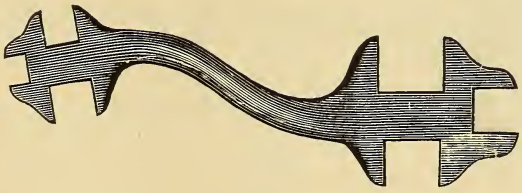
No. 224—	Diameter,	$2\frac{1}{4}$ inches.
225—	do.	$2\frac{1}{2}$ do.
226—	do.	$2\frac{3}{4}$ do.
227—	do.	3 do.
228—	do.	$3\frac{1}{4}$ do.
229—	do.	$3\frac{1}{2}$ do.
230—	do.	$3\frac{3}{4}$ do.
231—	do.	4 do.
232—	do.	$4\frac{1}{4}$ do.
233—	do.	$4\frac{1}{2}$ do.

MALLEABLE IRON CASTINGS—Continued.

WRENCHES.

THE FAVORITE.

No. 234— $\frac{3}{4}$ inch at square end; weight, - - 9 ounces.
235— $\frac{7}{8}$ do. do. do. - - - $9\frac{1}{2}$ do.
236—1 do. do. do. - - 10 do.
237—$1\frac{1}{8}$ do. do. do. - - - 10 do.
238—$1\frac{1}{4}$ do. do. do. - - $10\frac{1}{4}$ do.
239—$1\frac{3}{8}$ do. do. do. - - - $10\frac{1}{2}$ do.



S WRENCH.

No. 240—$12\frac{1}{2}$ inches long; weight, - - - $22\frac{1}{2}$ ounces.
241— $8\frac{3}{4}$ do. do. - - - $13\frac{1}{2}$ do.

MALLEABLE IRON CASTINGS—Continued.

WRENCHES—Continued.

No. 242—1 inch; weight, - - - - 11 ounces.
243—1⅛ do. do. - - - - 11¼ do.
244—1¼ do. do. - - - - 12¾ do.
245—1⅜ do. do. - - - - 16 do.
246—1½ do. do. - - - - 18 do.
247—1¾ do. do. - - - - 22 do.
248—2 do. do. - - - - 22½ do.

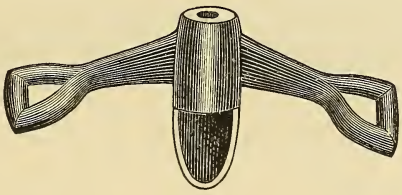
ADJUSTABLE WRENCH.

No. 249—Castings 10½ inches long; weight, - - 22 ounces.
250— do. 15 do. do. - - 35 do.

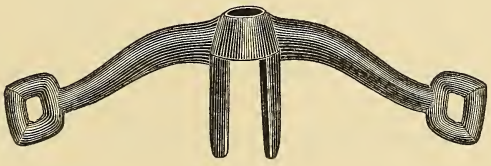
No. 251—10½ inches long, with screws cut, ready for use, $4.50 per doz.
252—15 do. do do. 6.50 do.

MALLEABLE IRON CASTINGS — Continued.

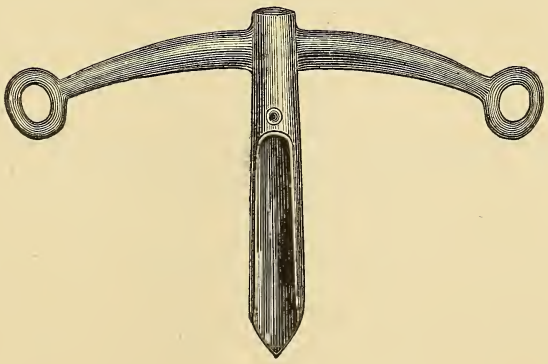
POLE YOKES AND SOCKETS.



No. 253—10 inches long, 1¾ inch loop; weight, - - 2¼ lbs.
254—Same pattern; solid end.



No. 255—12 inches long, 1⅜ inch loop; weight, - - 1¾ lbs.

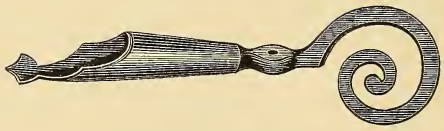


No. 256—13 inches long, 1⅜ inch loop; weight, - 1 lb. 13½ ounces.

MALLEABLE IRON CASTINGS—Continued.

POLE YOKES AND SOCKETS—Continued.

No. 257—12 inches long, 1¼ inch diameter; weight, - 34 ounces.
258—12 do. 1¼ do. do. - 36 do.



No. 259— - - - - - - 18 ounces.

No. 260—19 inches long, 1¼ inch diameter; weight, - 19 ounces.

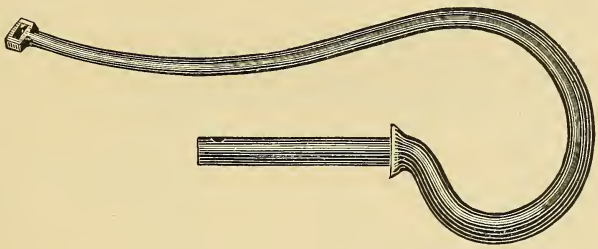
POLE YOKES.

No. 261—18 inches long, 1½ inch loop; weight, - 25 ounces.
262—21 do. 1⅝ do. do. - - 39 do.

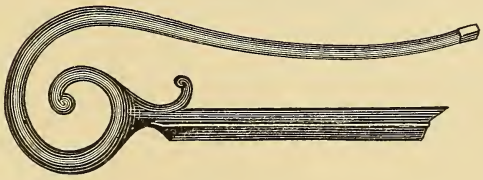
To be used with Nos. 256 and 257.

MALLEABLE IRON CASTINGS—Continued.

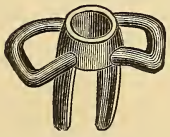
POLE YOKES AND SOCKETS—Continued.



No. 263—To be used with No. 253; weight, - 22 ounces.



No. 264—Weight, - - - - - - 30 ounces.

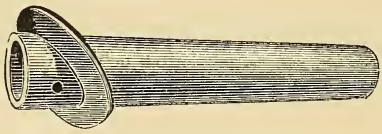


POLE CRABS.

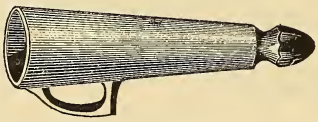
No. 265—1 inch hole, 1½ inch loop; weight, - - 11 ounces.
266—1⅛ do. 1⅝ do. do. - - 12 do.
267—1¼ do. 1¾ do. do. - - 20 do.

MALLEABLE IRON CASTINGS—Continued.

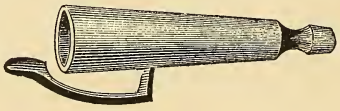
POLE YOKES AND SOCKETS—Continued.



No. 268—6 inches long, - - - - $1\frac{1}{8}$ in. hole.
269—6 do. - - - - - $1\frac{1}{4}$ do.



No. 270—$1\frac{1}{2}$ inch hole, - - - - - $26\frac{1}{2}$ ounces.

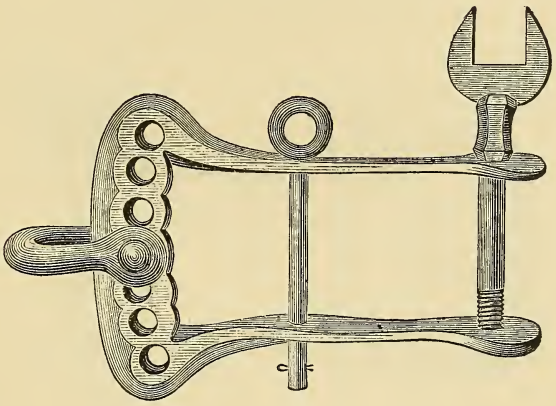


No. 271—$1\frac{1}{4}$ inch hole, - - - - - 16 ounces.

No. 272—$1\frac{1}{4}$ inch hole, - - - - - 15 ounces.

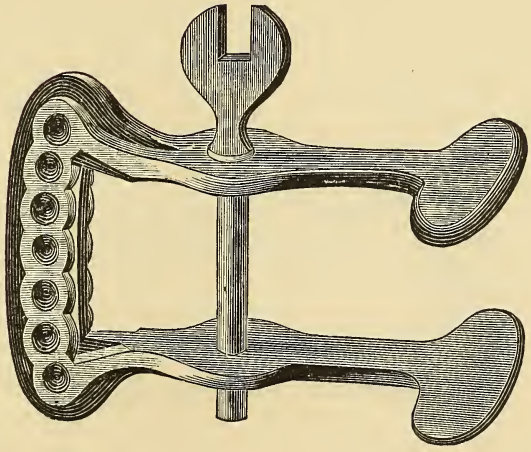
MALLEABLE IRON CASTINGS—Continued.

PLOW CLEVISES.



HALF SCOTCH.

No. 273—For 2½ inch beam, wrench pin; weight, - 42½ ounces.
274—For 2¾ do. do. do. - 52½ do.
275—For 3 do. do. do. - 48½ do.
276—For 2¾ do. do. do. - - 54 do.

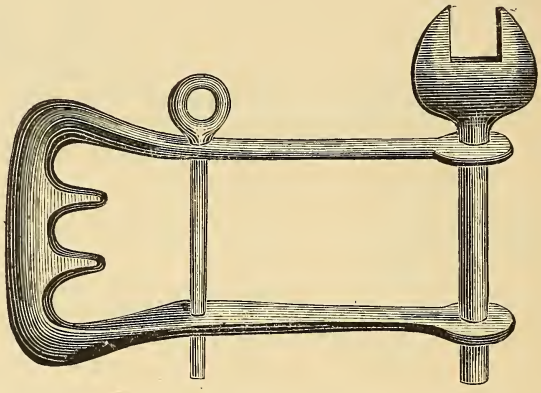


FULL SCOTCH.

No. 277—For 2¾ inch beam, wrench pin; weight, - 59½ ounces.
278—For 2⅞ do. do. do. - 64 do.
279—For 3 do. do. do. - 82 do.

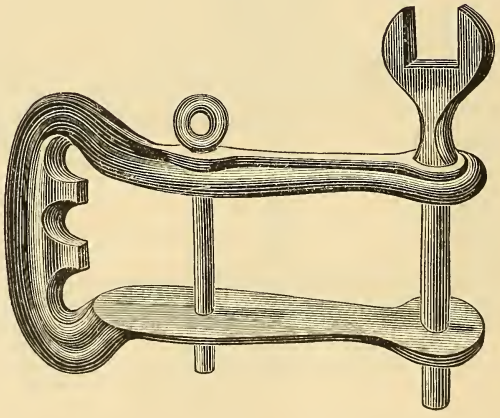
MALLEABLE IRON CASTINGS—Continued.

PLOW CLEVISES—Continued.



WESTERN PATTERN.

No. 280—For 2⅛ inch beam, wrench and pin; weight, - 28 ounces.
281—For 2¼ do. do. do. - 28 do.
282—For 2¼ do. do. do. - 24 do.
283—For 2½ do. do. do. - 27½ do.
284—For 2¾ do. do. do. - 40 do.

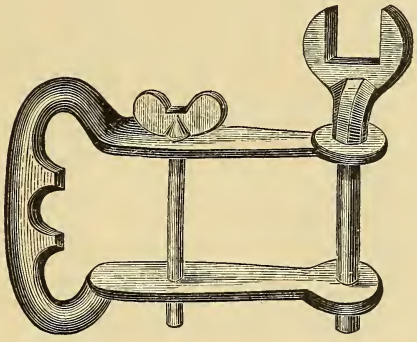


ILLINOIS PATTERN.

No. 285—For 1⅞ inch beam, wrench and pin; weight, - 19¾ ounces.
286—For 2 do. do. do. - 29½ do.
287—For 2¼ do. do. do. - 40 do.

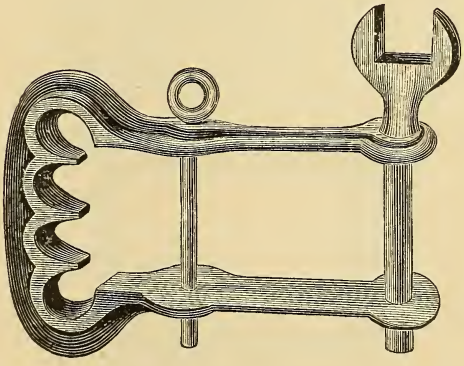
MALLEABLE IRON CASTINGS—Continued.

PLOW CLEVISES—Continued.



ILLINOIS PATTERN.

No. 288—For 2½ inch beam, wrench and pin; weight, - 32 ounces.
289—For 2⅝ do. do. do. - 33 do.

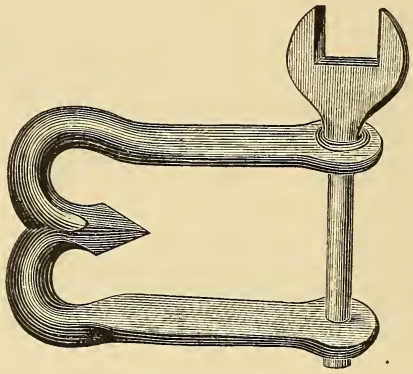


MASSACHUSETTS PATTERN.

No. 290—For 2 inch beam, wrench and pin; weight, - 20½ ounces.

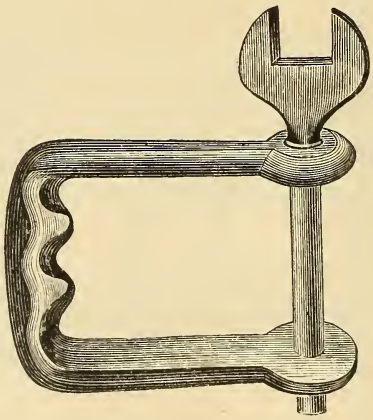
MALLEABLE IRON CASTINGS—Continued.

PLOW CLEVISES—Continued.



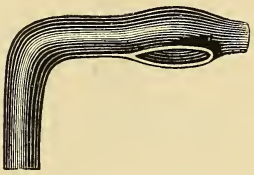
OHIO PATTERN.

No. 291—For $2\frac{1}{4}$ inch beam, wrench pin; weight, - $17\frac{1}{2}$ ounces.



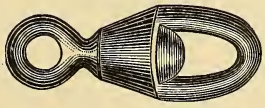
No. 292—For $2\frac{7}{8}$ inch beam, wrench pin; weight, - 22 ounces.

MALLEABLE IRON CASTINGS—Continued.



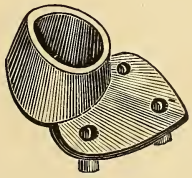
LATHE DOGS.

No. 293—Diameter of hole, - - - - ½ inch.
294— do. - - - - - ⅝ do.
295— do. - - - - - ¾ do.
296— do. - - - - - 1 do.
297— do. - - - - 1¼ do.
298— do. - - - - - 1½ do.
299— do. - - - - 1¾ do.
300— do. - - - - - 2 do.
301— do. - - - - 2¼ do.
302— do. - - - - - 2½ do.
303— do. - - - - 2¾ do.
304— do. - - - - - 3 do.
305— do. - - - - 3½ do.
306— do. - - - - - 4 do.



CHAIN SWIVELS.

No. 307— ⅝ in. loop, ⅜ in. hole, - - - 7 to the lb.
308—1½ do. ½ do. - - - - 5 do.
309—1⅛ do. ⅝ do. - - - 2 do.



HOE EYES.

No. 310 - These are calculated to have steel or other plates or blades riveted on the eye, as per pins shown in cut.

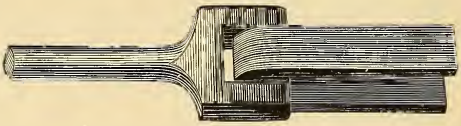
MALLEABLE IRON CASTINGS—Continued.

HAY FORK FERRULES.

No. 311—Large variety of sizes and patterns.

MANURE FORK FERRULES.

No. 312—Large variety of sizes and patterns.



PUMP ROD CONNECTIONS.

No. 313—Weight, - - - - - 10 ounces.

MELTING LADLES.

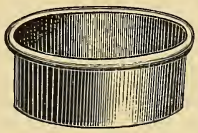
No. 314—3¾ inch bowl, - - - handle, 14½ inches.
315—4¾ do. - - - - do. 17 do.
316—6 do. - - - do. 18 do.

SHACKLE HOLDER.

No. 317—To fit 1¼ shackle, - - - - 3 ounces.
318— do. 1½ do. - - - - - 3¼ do.
319— do. 1¾ do. - - - - 3¾ do.

CARRIAGE HARDWARE.

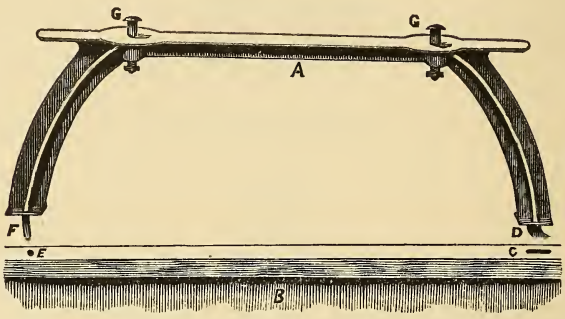
RIM BANDS.



TURNED.

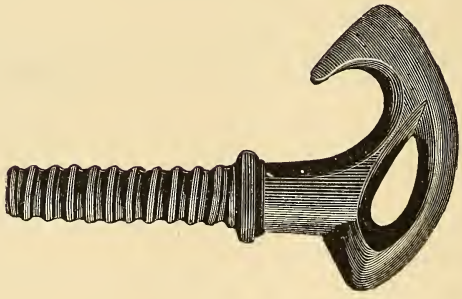
| | | |

CARRIAGE HARDWARE—Continued.



SEAT RAISER.

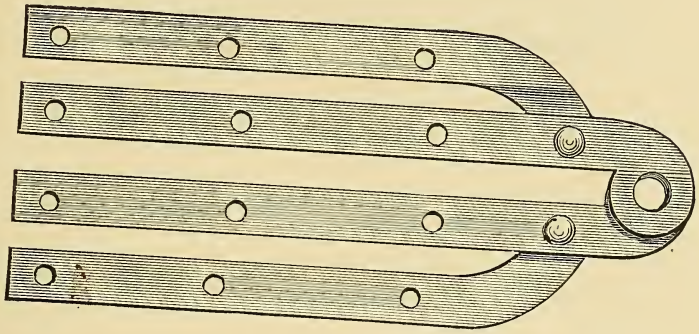
Malleable Iron, - - - - - $1.00 per set.



WELLER'S TRACE HOOK.

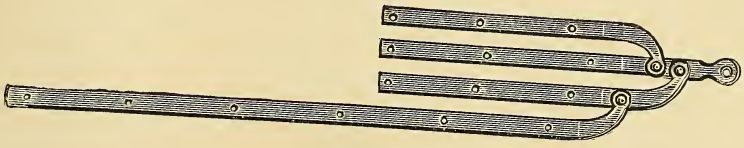
Malleable Iron, - - - - - - per lb.

CARRIAGE HARDWARE—Continued.



WROUGHT SLAT IRONS.

Four bow,	$4.50 per doz. sets.
Five do.	6.00 do.

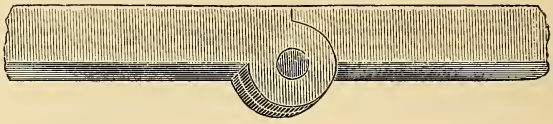


PHILADELPHIA PATTERN.

Four bow,	$9.00 per doz. sets.
Five do.	12.00 do.
Four bow—Silver plated,	27.00 do.
Five do do.	36.00 do.

CARRIAGE HARDWARE—Continued.

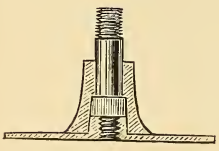
STUMP JOINTS.

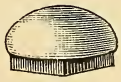


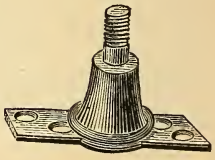
MILLED.

$\frac{1}{2}$ inch × $\frac{1}{2}$ inch,	$2.10	per doz.
$\frac{9}{16}$ do. × $\frac{9}{16}$ do.	2.35	do.
$\frac{5}{8}$ do. × $\frac{5}{8}$ do.	2.60	do.
$\frac{5}{8}$ do. × $\frac{3}{8}$ do.	2.60	do.
$\frac{5}{8}$ do. × $\frac{7}{16}$ do.	2.60	do.
$\frac{5}{8}$ do. × $\frac{1}{2}$ do.	2.60	do.
$\frac{3}{4}$ do. × $\frac{1}{2}$ do.	5.50	do.
$\frac{7}{8}$ do. × $\frac{1}{2}$ do.	6.50	do.
$\frac{7}{8}$ do. × $\frac{5}{8}$ do.	7.50	do.
1 do. × $\frac{1}{2}$ do.	12.00	do.
1 do. × $\frac{5}{8}$ do.	12.00	do.
$1\frac{1}{8}$ do. × $\frac{1}{2}$ do.		
$1\frac{1}{8}$ do. × $\frac{5}{8}$ do.		
$1\frac{1}{4}$ do. × $\frac{1}{2}$ do.		
$1\frac{1}{2}$ do. × $\frac{5}{8}$ do.		

TOP PROPS.







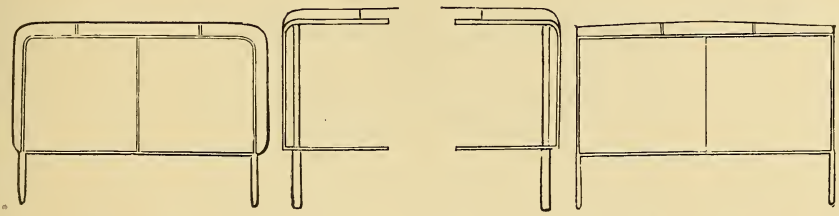
THOMAS' PATENT AND COMBINATION.

Japanned collars, without nuts,	70 cents	per set.
do. with silver nuts and rivets complete,	$1.50	do.
do. do. oreide do. do.	1.50	do.
do. do. gold do. do.	3.00	do.
Common, with silver nuts and rivets complete,	50 do.	do.
do. with sil. metal cap, nuts and rivets complete,	$1.00	do.

The above props, except common, are furnished with either round or square nuts and rivets.

CARRIAGE HARDWARE—Continued.

DASHES.



No. 100. No. 200. No. 300.

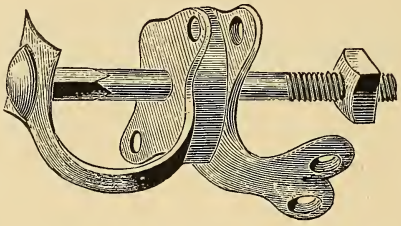
No. 100—In halves, plain,	$20.00	per doz.
200— do. do.	25.00	do.
300— do. do.	20.00	do.
No. 100—Whole, plain,	34.00	do.
200— do. do.	37.50	do.
300— do. do.	34.00	do.
No. 100—In halves, plated,	30.00	do.
200— do. do.	45.00	do.
300— do. do.	30.00	do.
No. 100—Whole top rail plated,	52.50	do.
200— do. do.	52.50	do.
300— do. do.	45.00	do.
No. 100—Top corner plated,	45.00	do.

DASH RODS.

¼ inch, with plated collar,	$4.50	per doz.
5/16 do. do. do.	4.50	do.
⅜ do. do. do.	4.75	do.
¼ do. do. do. and rod,		do.
5/16 do. do. do. do.		do.
⅜ do. do. do. do.		do.

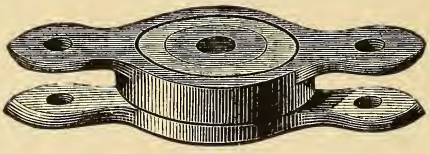
CARRIAGE HARDWARE—Continued.

WHIFFLETREE PLATES.



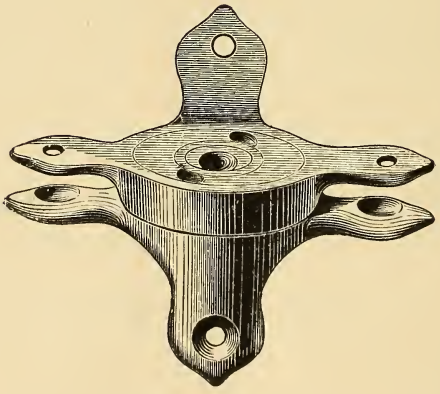
PENNOYER'S PATENT.

No. 1—For $\frac{5}{8}$ and $\frac{3}{4}$ axles,	- - - -	$5.00 per doz.
2—For $\frac{7}{8}$	do. - - - -	5.00 do.
3—For 1	do. - - - -	5.00 do.



CLARK'S PATENT.

No. 1,	- - - - - -	$3.00 per doz.
2,	- - - - - -	3.00 do.



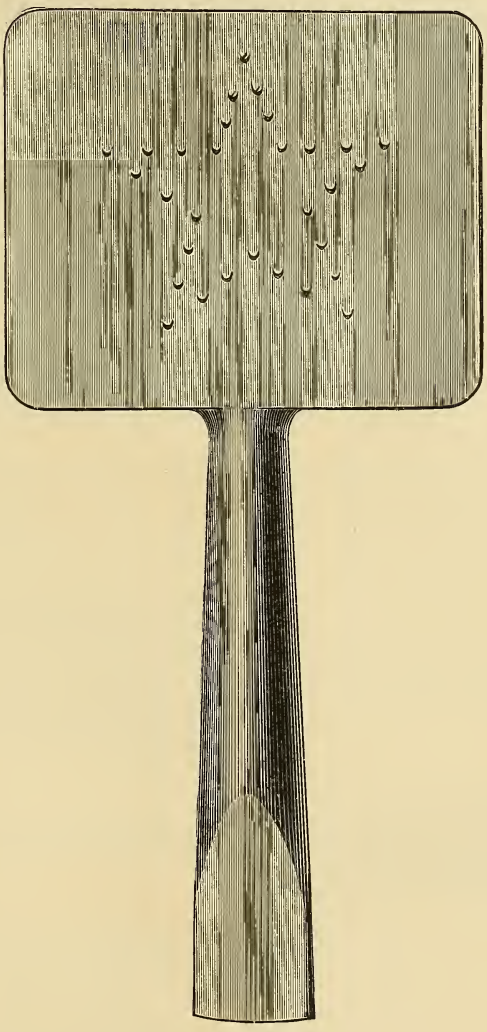
CLARK'S PATENT—With Flange.

No. 3,	- - - - - -	$3.50 per doz.

See page 201.

CARRIAGE HARDWARE—Continued.

STEP PADS.



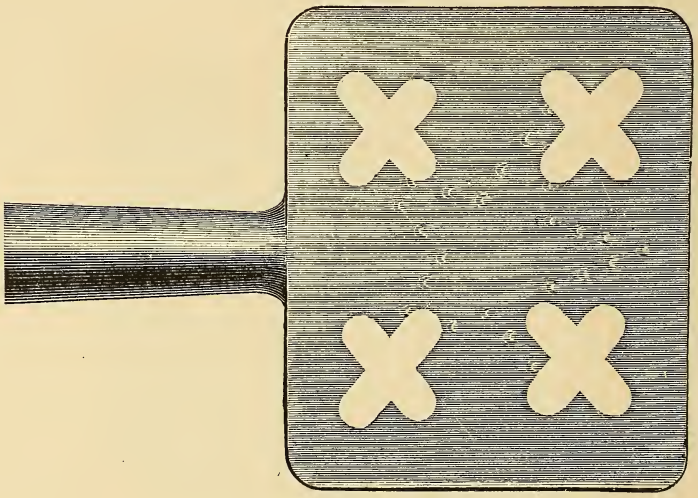
PLAIN PATTERN.

No. 1, - - - - - - $12.00 per doz. prs.
2, for light buggies, - - - 12.00 do.

See page 200.

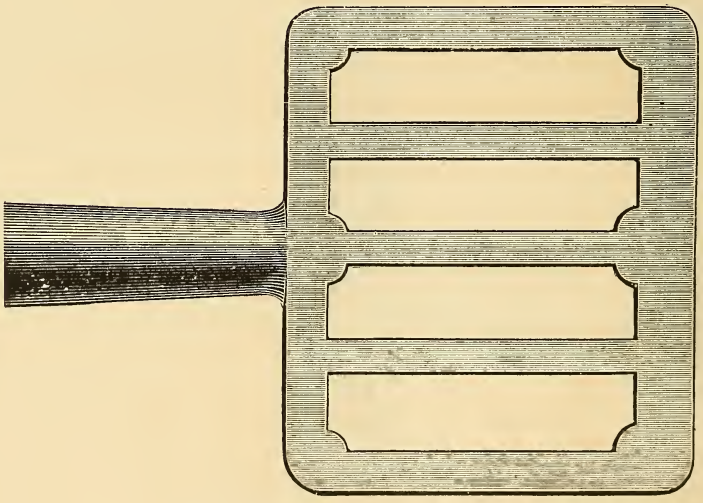
CARRIAGE HARDWARE—Continued.

STEP PADS—Continued.



X PATTERN.

No. 1, - - - - - $12.00 per doz. prs.
2, - - - - - 12.00 do.

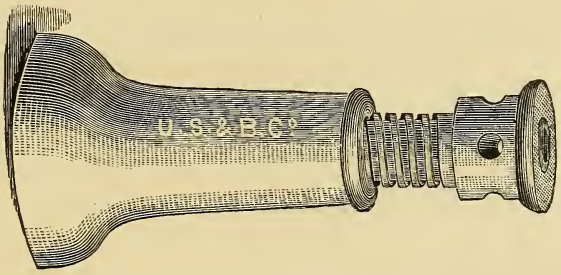


RIBBED PATTERN.

No. 1, - - - - - $16.50 per doz. prs.
2, - - - - - 16.50 do.

See page 200.

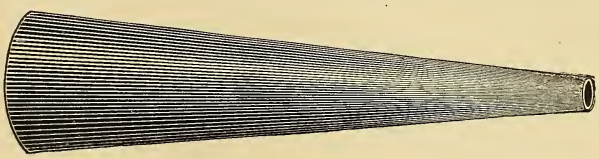
JACK SCREWS.



FORGED THREAD.

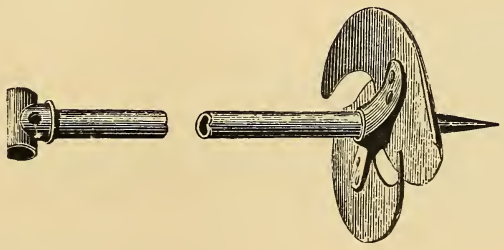
DIAMETER OF SCREWS.	LENGTH OF IRON BARREL.							
	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	20 in.	24 in.
1¼ inches, -	$2.50	$3.00						
1½ do. - -	3.00	3.50	$3.75	$4.00				
1¾ do. -	3.25	3.75	4.00	4.50	$4.75	$5.90		
2 do. - -	4.00	4.25	4.75	5.25	6.00	7.00	$8.00	$10.00
2¼ do. -		6.50	7.00	7.50	8.00	9.00	10.00	12.00
2½ do. - -		7.50	8.00	8.50	9.00	9.50	11.00	13.00

MANDRELS.



CAST IRON.

Price, - - - - - - - $12.00 each.



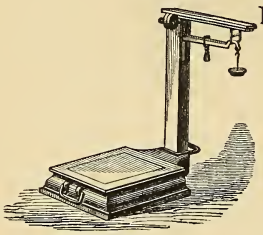
POST AUGERS.

Post Augers, - - - - - $25.00 per doz.

FAIRBANKS' STANDARD SCALES.

PORTABLE PLATFORM SCALES.

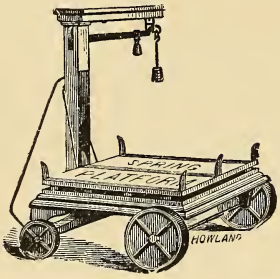
WITH WHEELS.



	Capacity.	Platform.	Price.
No. 7	—2,000 lbs.	30 × 23 in.	$75.00 each.
8	—1,600 lbs.	30 × 23 in.	65.00 do.
9	—1,400 lbs.	28 × 21 in.	56.00 do.
10	—1,200 lbs.	28 × 20 in.	49.00 do.
10½	— 900 lbs.	26 × 17 in.	43.00 do.
11	— 600 lbs.	25 × 16 in.	33.00 do.
11½	— 400 lbs.	21 × 15 in.	26.00 do.

ROLLING MILL OR IRON SCALES.

WITH RUBBER SPRING PLATFORM.

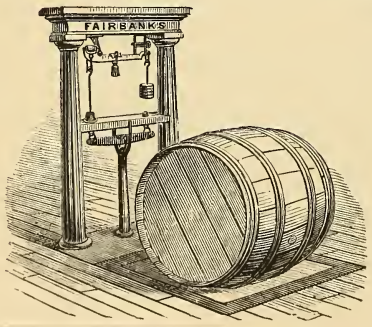


	Capacity.	Platform.	Price.
1st size	—4,000 lbs.	39 × 30 in.	$160.00 each.
2d do.	—2,500 lbs.	30 × 23 in.	125.00 do.

By a new and important arrangement, these scales are fitted with patent India rubber spring platforms, so as to secure very great durability, when used in foundries, iron houses, and wherever very heavy weighing is required.

DORMANT WAREHOUSE SCALES.

WITH TWO IRON PILLARS AND SLIDING POISE BEAM.



	Capacity.	Platform.	Price.
No. 1	—5,000 lbs.	48 × 48 in.	$165 each.
4	—3,500 lbs.	41 × 43 in.	115 do.
5	—2,500 lbs.	30 × 36 in.	103 do.

SOLD AT MANUFACTURERS' PRICES

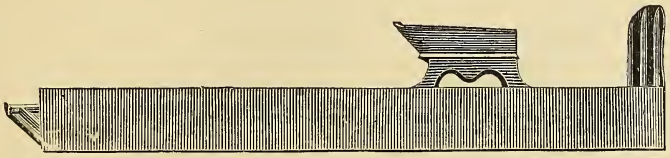
BY

HALL, KIMBARK & CO.

FAIRBANKS, GREENLEAF & CO.,
137 and 139 State Street, Chicago.
302 and 304 Washington Avenue, St. Louis.

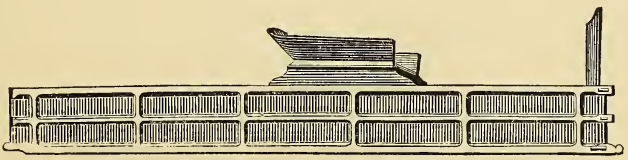
FAIRBANKS, MORSE & CO.,
139 Walnut Street, Cincinnati.
102 Second Avenue, Pittsburg.
182 Superior Street, Cleveland.

WAGON AND CARRIAGE BODIES.



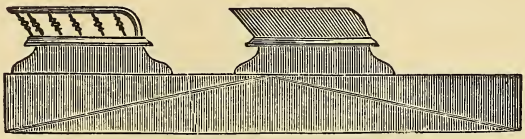
SPRING WAGON.

No. 0—7 to 8 feet long, - - - - $20.00 each.



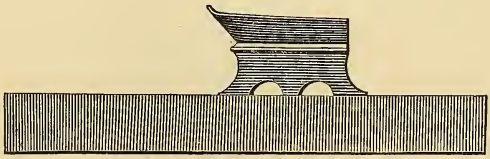
EXPRESS WAGON.

No. 1, - - - - - - - $25.00 each.



JAGGER.

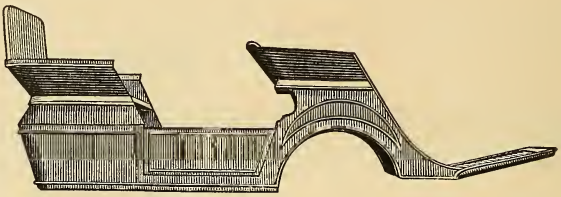
No. 2—5 to 6 feet long, - - - - $16.00 each.



SPORTING.

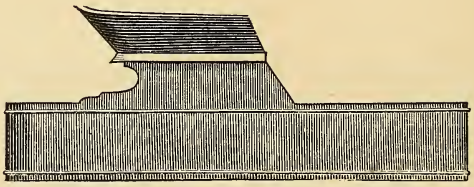
No. 3—Round corners, 5 to 6 feet long, - - $16.00 each.

WAGON AND CARRIAGE BODIES—Continued.



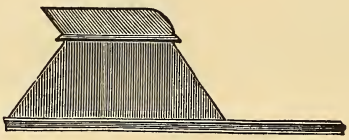
TWO SEAT.

No. 4—Cut under, - - - - - $40.00 each.



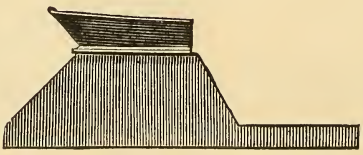
PIANO.

No. 5—Round corners, - - - - $16.00 each.



SOLID SILL.

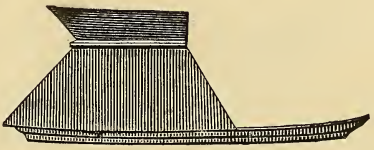
No. 6, - - - - - - - $15.00 each.



TROTTING.

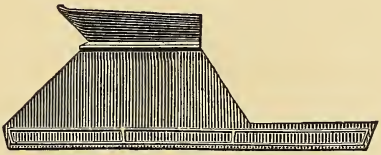
No. 7, - - - - - - - $10.00 each.

WAGON AND CARRIAGE BODIES—Continued.



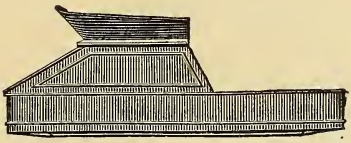
YACHT.

No. 8, - - - - - - - $15.00 each.



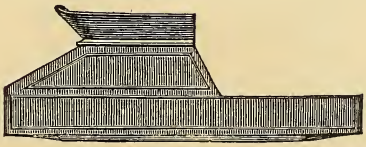
CONCORD.

No. 9, - - - - - - $10.00 each.



NEW YORK BOX.

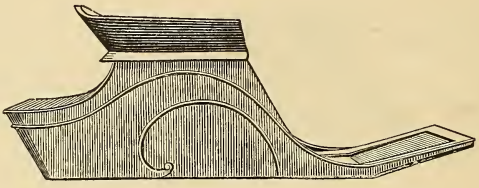
No. 10—Round corners, - - - - $12.00 each.



NEW YORK BOX.

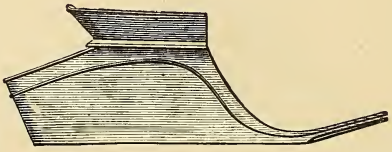
No. 11—Square corners, - - - - $11.00 each.

WAGON AND CARRIAGE BODIES—Continued.



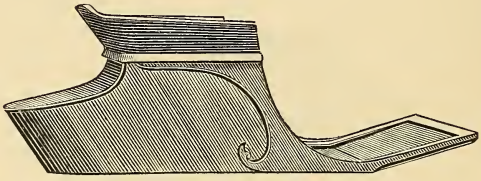
COAL BOX.

No. 12—Fancy bowl, - - - - - $20.00 each.



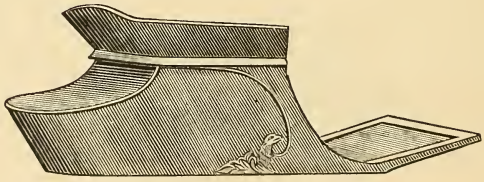
COAL BOX.

No. 13—Plain, - - - - - - $20.00 each.



COAL BOX.

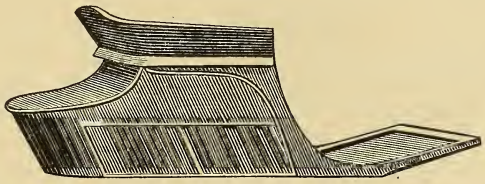
No. 14—Bent in one piece, - - - - $20.00 each.



COAL BOX.

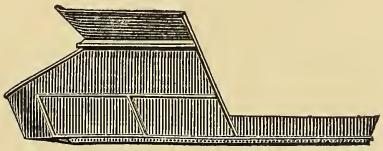
No. 14—Carved side, bent in one piece, - - $25.00 each.

WAGON AND CARRIAGE BODIES—Continued.



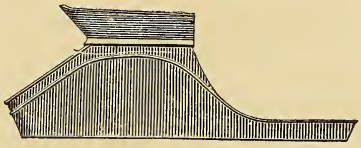
COAL BOX.

No. 15—Panel side, bent in one piece, - - $20.00 each.



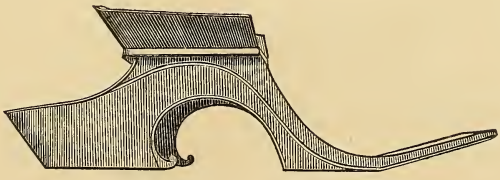
COAL BOX.

No. 16—Square front, swell back, - - - $20.00 each.



COAL BOX.

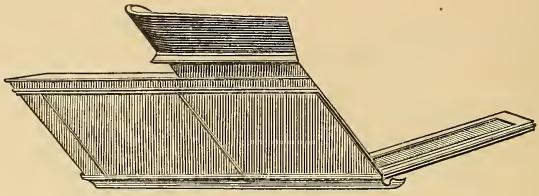
No. 17—Square front, - - - - - $16.00 each.



ONE SEAT.

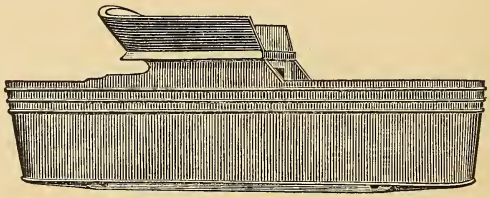
No. 18—Cut under, - - - - - $25.00 each.

WAGON AND CARRIAGE BODIES—Continued.



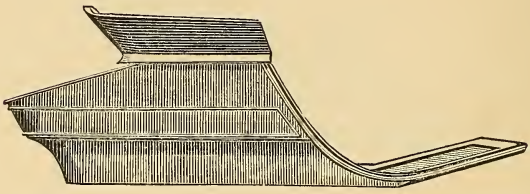
COAL BOX.

No. 19—Deep side, - - - - - $25.00 each.



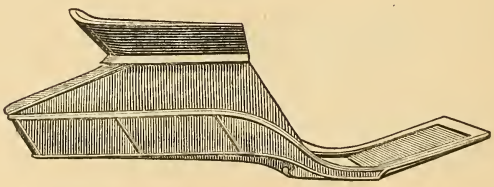
PHILADELPHIA PIANO.

No. 20, - - - - - - $25.00 each.



CONCAVE COAL BOX.

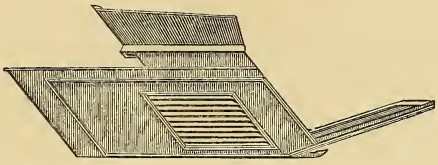
No. 21, - - - - - - $25.00 each.



DROP FRONT.

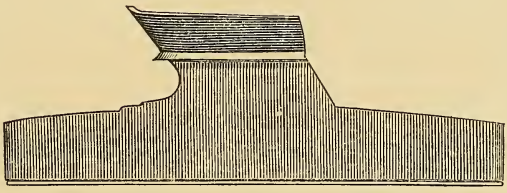
No. 22—Panel side, - - - - - $25.00 each.

WAGON AND CARRIAGE BODIES—Continued.



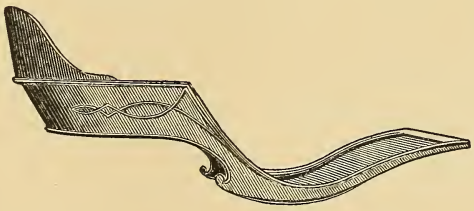
BLIND SIDE.

No. 23—Coal box, - - - - - $25.00 each.



PIANO.

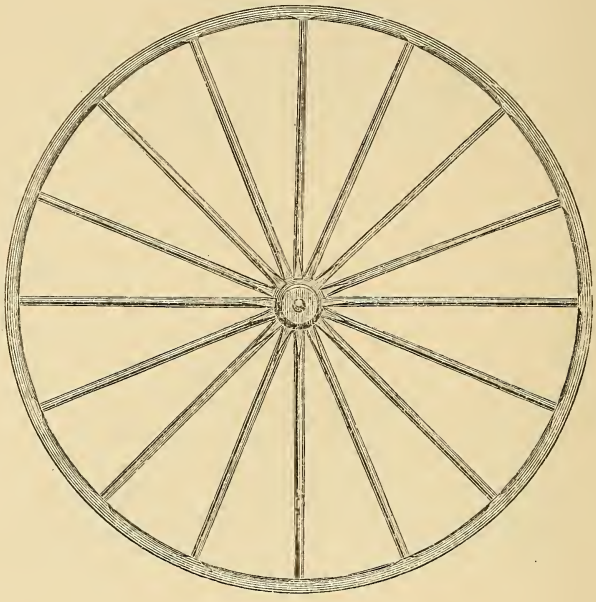
No. 24—Round Corner, - - - - $16.00 each.



PHÆTON.

No. 25, - - - - - - $25.00 each.

WHEELS.



CARRIAGE—White Second Growth Timber.

⅞	inch width of felloe,	- - - -	$20.00 per set.
1	do. do.	- - - - -	20.00 do.
1⅛	do. do.	- - - -	20.00 do.
1¼	do. do.	- - - . -	20.00 do.

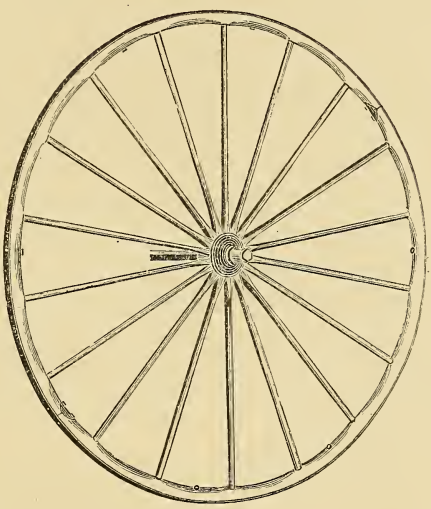
CARRIAGE—Selected Timber.

⅞	inch width of felloe,	- - - -	$14.50 per set.
1	do. do.	- - - - -	14.50 do.
1⅛	do. do.	- - - -	14.50 do.
1¼	do. do.	- - - - -	14.50 do.

SULKY—Second Growth Timber.

⅞	inch width of felloe,	- - - -	$12.00 per set.
1	do. do.	- - - - -	12.00 do.
1⅛	do. do.	- - - -	12.00 do.
1¼	do. do.	- - - - -	12.00 do.

WHEELS — Continued.



STERICK'S PATENT.

Brass hub, short arm, solid collar, case-hardened, full half-patent, improved taper, and patent washer axle, made of Norway iron; first quality second growth hickory spokes; steel or mixed tire, bolted and felloe-capped, complete.

Price per Set, including Axle and Tire.

STYLES.	WIDTH OF TREAD.		
	1 inch and under.	1⅛ inch.	1¼ inch.
Brass box, mal. iron front, -	$44.00	$48.00	$52.00
do. do. do. nickel cap,	45.00	49.00	53.00
Brass hub, polished, - -	46.00	51.00	57.00
do. nickel plated cap, -	47.00	52.00	58.00
do. full nickel plated, -	51.00	56.00	62.00
do. gold plated, - -	92.00	96.00	105.00
Steel axles, extra, - -	2.50	3.50	4.50

N. B.—In ordering Wheels please give size of axle, iron or steel, height of wheel, tread, depth of felloe, steel or mixed tire, and style of hub.

See pages 262 and 263.

WHEELS — Continued.

STERICK'S PATENT — Continued.

1st. The hub is made of brass, which is the best metal for bearing on iron or steel—creating less friction; therefore runs easier, stiller, requires less oil, is less liable to heat if allowed to become dry, and lasts longer.

2d. Defective or broken spokes may be replaced with new ones without removing the tire, thereby saving time and expense.

3d. Each spoke is held firmly and independently of the others in a movable mortise, forming a compound wedge around the spoke, sustaining a pressure, which, if necessary, can be increased by tightening the screw-cap.

4th. Each wheel contains eighteen spokes, giving better support to the rim, admitting of lighter spokes, and causing a finer general appearance.

5th. The box is the body part of the wheel, and cannot loosen, but, by the peculiarity of its construction, can be removed at any time without taking the wheel apart, and at less expense than it requires to re-box an ordinary wheel.

6th. Capped so as to prevent oil from escaping, dust, sand or mud from entering, covering nut on axle, and giving complete finish to the hub.

7th. Oil cannot reach the spokes and cause them to loosen.

8th. The hub neither checks nor splits.

9th. The axle is less liable to break.

10th. The patent washer prevents the possibility of the wheel running off.

11th. By the application of Toomey's process for setting the tire, we entirely obviate rim-binding, and partially counteract the expansion and contraction of the tire, adding much to the durability of the wheel.

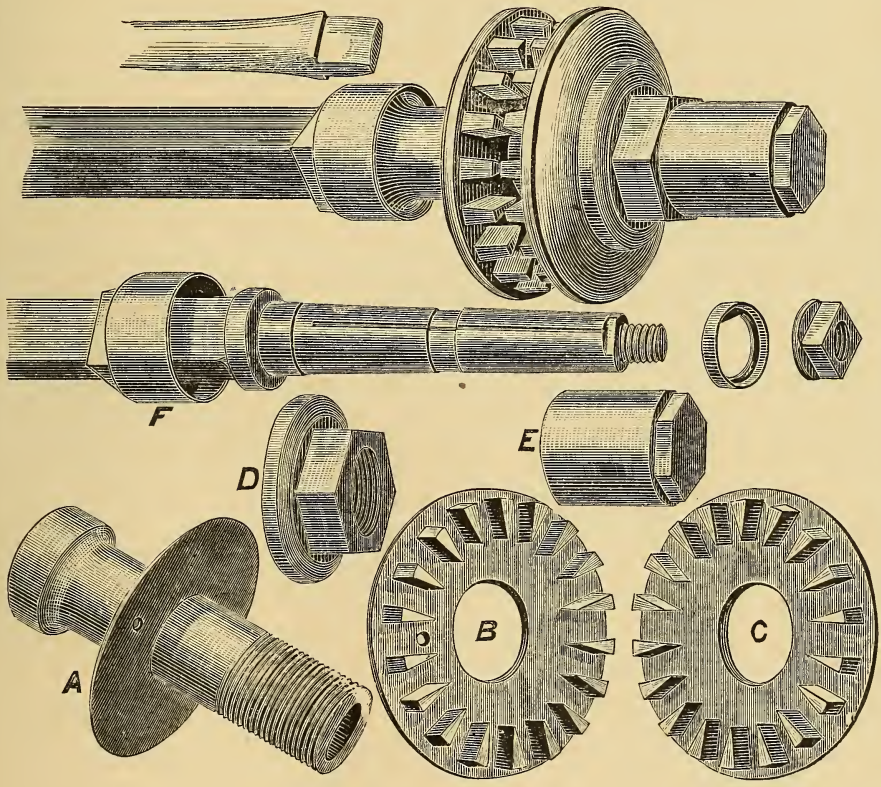
12th. The wheel presents a fine appearance, and admits of being ornamented in a variety of ways. The beauty of the wheel depends much on the size and shape of the hub. The small hub has much the advantage in appearance over the large, clumsy one. We combine greater strength and more durability in a smaller hub than has ever been done heretofore.

13th. If, in case of accident, the hub is broken, any part of it may be duplicated, or axle furnished.

The axle is made expressly for and fits the box closely. Each axle is numbered; also, outer end of box—which numbers must correspond when put together.

WHEELS—Continued.

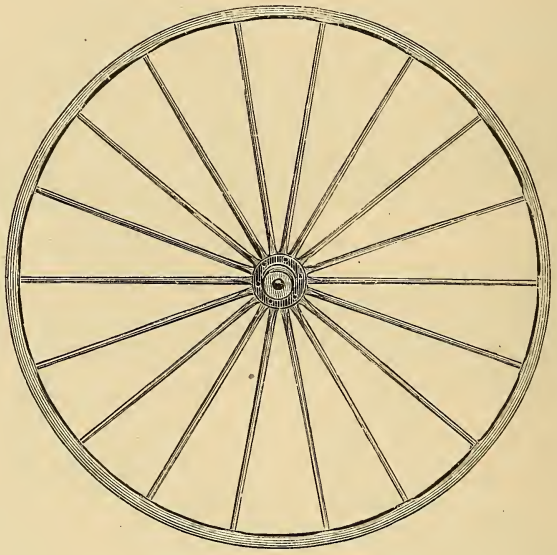
STERICK'S PATENT—Continued.



SECTIONAL VIEW.

A, Box.
B, Rear Flange.
C, Front Flange.
D, Screw Cap.
E, Front Cap.
F, Sand Band.

WHEELS — Continued.



SARVEN'S PATENT.

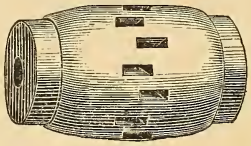
The following list shows the proportions of the different sized wheels, subject to any change in height, tread, depth of felloe and length of hub, that the party ordering may wish. The size of the spoke and the number of the flange, as given, cannot be changed. The sizes enumerated kept constantly in stock; other sizes made to order.

WHEELS—Continued.

SARVEN'S PATENT—Continued.

No. of Flange.	Height of Front Wheel.	Height of Hind Wheel.	Width of Tread.	Depth of Felloe.	Size of Spoke.	Diam. of Hub.	Length of Hub.	Price.
07	3.9	4.1	$\frac{5}{8}$ to $\frac{3}{4}$	$\frac{7}{8}$ to $1\frac{5}{16}$	$\frac{3}{4}$ to $1\frac{3}{16}$	$2\frac{1}{2}$	$5\frac{1}{2}$, 6 to $6\frac{1}{2}$	$30.00
05	3.9 to 3.10	4 to 4.2	$\frac{3}{4}$	1	$\frac{7}{8}$ to $\frac{3}{4}$	$2\frac{5}{8}$	6 to $6\frac{1}{2}$	30.00
03	3.10 to 4	4 to 4.3	$\frac{3}{4}$ to $\frac{7}{8}$	$\frac{7}{8}$ to $1\frac{1}{8}$	$\frac{7}{8}$	$2\frac{7}{8}$	6, $6\frac{1}{2}$ to 7	30.00
0	3.10	4.2	$\frac{7}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	$3\frac{1}{16}$	6, $6\frac{1}{2}$ to 7	30.00
1	3.10	4.2	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{5}{16}$	$3\frac{1}{8}$	6 to 7	30.00
3	3.10	4.2	1	$1\frac{3}{16}$	1	$3\frac{1}{4}$	6 to 7	30.00
5	3.8	4 to 4.2	1	$1\frac{3}{16}$	$1\frac{1}{16}$	$3\frac{3}{8}$	$6\frac{1}{2}$ to 7	30.00
7	3.8	4 to 4.2	1 to $1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$3\frac{1}{2}$	$6\frac{1}{2}$ to 7	30.00
9	3.6 to 3.8	4 to 4.2	1 to $1\frac{1}{8}$	$1\frac{1}{4}$ to $1\frac{3}{8}$	$1\frac{1}{8}$	$3\frac{5}{8}$	$6\frac{1}{2}$ to 7	30.00
9	3.6 to 3.8	4 to 4.2	1 to $1\frac{1}{8}$	$1\frac{1}{4}$ to $1\frac{3}{8}$	$1\frac{3}{16}$	$3\frac{5}{8}$	$6\frac{1}{2}$ to 7	30.00
11	3.6 to 3.8	4 to 4.2	$1\frac{1}{16}$ to $1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{4}$	$3\frac{3}{4}$	7	30.00
13	3.6 to 3.8	4 to 4.2	$1\frac{1}{8}$ to $1\frac{1}{4}$	$1\frac{3}{8}$ to $1\frac{7}{16}$	$1\frac{1}{4}$	$3\frac{7}{8}$	7 to $7\frac{1}{2}$	30.00
15	3.2 to 3.8	4 to 4.2	1 $1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{3}{8}$	4	7 to $7\frac{1}{2}$	33.50
17	3.2 to 3.8	4 to 4.2	1 $1\frac{1}{4}$	$1\frac{7}{16}$	$1\frac{3}{8}$	$4\frac{1}{8}$	7 to $7\frac{1}{2}$	33.50
19	3.2 to 3.8	4 to 4.2	$1\frac{1}{4}$ to $1\frac{3}{8}$	$1\frac{7}{16}$ to $1\frac{5}{8}$	$1\frac{3}{8}$	$4\frac{3}{16}$	7 to 8	34.50
23	3.2 to 3.8	4 to 4.2	1 $1\frac{3}{8}$	$1\frac{5}{8}$	$1\frac{1}{2}$	$4\frac{1}{4}$	7 to 8	36.00
25	3.2 to 3.8	4 to 4.2	$1\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{5}{8}$ to $1\frac{3}{4}$	$1\frac{1}{2}$	$4\frac{1}{2}$	7 to 9	37.25
27	3.2 to 3.8	4 to 4.2	$1\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{5}{8}$ to $1\frac{3}{4}$	$1\frac{1}{2}$	$4\frac{3}{4}$	8 to $9\frac{1}{2}$	37.25
31	3.2 to 3.8	4 to 4.2	$1\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{5}{8}$ to $1\frac{3}{4}$	$1\frac{9}{16}$	5	8 to $9\frac{1}{2}$	38.25
35	3.2 to 3.8	4 to 4.4	$1\frac{3}{8}$ to $1\frac{1}{2}$	$1\frac{5}{8}$ to $1\frac{3}{4}$	$1\frac{9}{16}$	$5\frac{1}{4}$	8 to $9\frac{1}{2}$	38.25
37	3.2 to 3.8	4 to 4.4	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{5}{8}$	$5\frac{3}{8}$	8 to $9\frac{1}{2}$	42.00
39	3.2 to 3.8	4 to 4.4	$1\frac{1}{2}$	$1\frac{3}{4}$ to 2	$1\frac{5}{8}$	$5\frac{1}{2}$	8 to $9\frac{1}{2}$	43.00
45	3.2 to 3.8	4 to 4.4	$1\frac{5}{8}$ to $1\frac{3}{4}$	2 to $2\frac{1}{4}$	$1\frac{3}{4}$	$5\frac{5}{8}$	8 to 10	48.00
47	3.2 to 3.8	4 to 4.6	$1\frac{5}{8}$ to $1\frac{3}{4}$	2 to $2\frac{1}{4}$	$1\frac{3}{4}$	$5\frac{3}{4}$	8 to 11	48.00
49	3.2 to 3.8	4 to 4.8	$1\frac{5}{8}$ to $1\frac{3}{4}$	2 to $2\frac{1}{4}$	$1\frac{3}{4}$	$5\frac{7}{8}$	8 to $11\frac{1}{2}$	48.00
51	3.2 to 3.8	4 to 4.8	$1\frac{5}{8}$ to $1\frac{3}{4}$	2 to $2\frac{1}{4}$	$1\frac{3}{4}$	$6\frac{1}{4}$	10 to 12	48.00
51	3.2 to 3.8	4 to 4.8	$1\frac{5}{8}$ to $1\frac{3}{4}$	2 to $2\frac{1}{4}$	2	$6\frac{1}{4}$	10 to 12	54.00
55	3.2 to 3.8	4 to 4.8	$1\frac{3}{4}$ to $1\frac{7}{8}$	2 to $2\frac{1}{2}$	2	$6\frac{5}{8}$	10 to 12	54.00
61	3.2 to 3.8	4 to 4.8	$1\frac{3}{4}$ to 2	$2\frac{1}{8}$ to $2\frac{1}{2}$	2	$6\frac{3}{4}$	10 to 13	54.00
63	3.2 to 3.8	4 to 4.8	$1\frac{3}{4}$ to 2	$2\frac{1}{4}$ to $2\frac{3}{4}$	$2\frac{1}{4}$	$7\frac{1}{4}$	11 to 13	60.00
67	3.2 to 3.8	4 to 4.8	$1\frac{3}{4}$ to 2	$2\frac{1}{4}$ to $2\frac{3}{4}$	$2\frac{1}{4}$	$7\frac{1}{4}$	11 to 13	60.00
67	3.2 to 3.8	4 to 4.8	$1\frac{3}{4}$ to 2	$2\frac{1}{4}$ to $2\frac{3}{4}$	$2\frac{1}{2}$	$7\frac{1}{4}$	11 to 13	66.00
73	3.4 to 3.8	4 to 4.8	2 to $2\frac{1}{4}$	$2\frac{3}{4}$ to 3	$2\frac{1}{2}$	$7\frac{5}{8}$	11 to 14	66.00
85	3.4 to 3.8	4 to 4.8	2 to $2\frac{1}{4}$	$2\frac{3}{4}$ to 3	$2\frac{5}{8}$	$8\frac{1}{4}$	12 to 14	72.00
95	3.4 to 3.8	4 to 4.8	2 to $2\frac{1}{2}$	3 to $3\frac{1}{4}$	$2\frac{3}{4}$	9	12 to 16	90.00
95	3.4 to 3.8	4 to 4.8	2 to $2\frac{1}{2}$	3 to $3\frac{3}{4}$	3	9	12 to 16	96.00

HUBS.



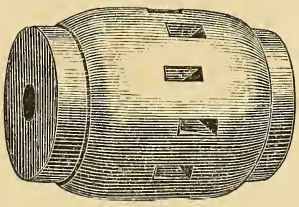
EXPRESS AND BUGGY—Mortised.

$3\frac{1}{2}$	× 6	—Mortised for	$\frac{7}{8}$	inch spokes,	-		-	$1.25	per set.	
4	× 6	do.	$\frac{7}{8}$	do.	-	-	-	1.25	do.	
$3\frac{1}{2}$	× $6\frac{1}{2}$	do.	$\frac{7}{8}$	do.	-		-	1.25	do.	
$3\frac{3}{4}$	× $6\frac{1}{2}$	do.	1	do.	-	-	-	1.25	do.	
4	× $6\frac{1}{2}$	do.	1	do.	-		-	1.25	do.	
$4\frac{1}{4}$	× $6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	-	1.25	do.	
$4\frac{1}{2}$	× $6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-		-	1.25	do.	
5	× $6\frac{1}{2}$	do.	$1\frac{1}{4}$	do.	-	-	-	1.25	do.	
4	× 7	do.	1	do.	-		-	1.25	do.	
$4\frac{1}{4}$	× 7	do.	$1\frac{1}{8}$	do.	-	-	-	1.25	do.	
$4\frac{1}{2}$	× 7	do.	$1\frac{1}{8}$	do.	-		-	1.25	do.	
$4\frac{3}{4}$	× 7	do.	$1\frac{1}{8}$	do.	-	-	-	1.25	do.	
5	× 7	do.	$1\frac{1}{4}$	do.	-		-	1.25	do.	
$5\frac{1}{4}$	× 7	do.	$1\frac{3}{8}$	do.	-	-	-	1.50	do.	
$5\frac{1}{2}$	× 7	do.	$1\frac{3}{8}$	do.	-		-	1.50	do.	
$5\frac{3}{4}$	× 7	do.	$1\frac{1}{2}$	do.	-	-	-	1.50	do.	
6	× 7	do.	$1\frac{1}{2}$	do.	-		-	1.50	do.	
$4\frac{1}{4}$	× $7\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	-	1.25	do.	
$4\frac{1}{2}$	× $7\frac{1}{2}$	do.	$1\frac{1}{4}$	do.	-		-	1.25	do.	
$4\frac{3}{4}$	× $7\frac{1}{2}$	do.	$1\frac{1}{4}$	do.	-	-	-	1.25	do.	
5	× $7\frac{1}{2}$	do.	$1\frac{1}{4}$	do.	-		-	1.25	do.	
$5\frac{1}{4}$	× $7\frac{1}{2}$	do.	$1\frac{3}{8}$	do.	-	-	-	1.50	do.	
$5\frac{1}{2}$	× $7\frac{1}{2}$	do.	$1\frac{3}{8}$	do.	-		-	1.50	do.	
$5\frac{3}{4}$	× $7\frac{1}{2}$	do.	$1\frac{1}{2}$	do.	-	-	-	1.50	do.	
6	× $7\frac{1}{2}$	do.	$1\frac{1}{2}$	do.	-		-	1.50	do.	
$5\frac{3}{4}$	× 8	do.	$1\frac{1}{2}$	do.	-	-	-	1.50	do.	
6	× 8	do.	$1\frac{1}{2}$	do.	-		-	1.50	do.	
$6\frac{1}{2}$	× 8	do.	$1\frac{5}{8}$	do.	-	-	-	1.60	do.	
7	× 8	do.	$1\frac{5}{8}$	do.	-		-	1.60	do.	
6	× $8\frac{1}{2}$	do.	$1\frac{1}{2}$	do.	-	-	-	1.50	do.	
$6\frac{1}{2}$	× $8\frac{1}{2}$	do.	$1\frac{3}{4}$	do.	-		-	1.60	do.	
6	× 9	do.	$1\frac{5}{8}$	do.	-	-	-	1.50	do.	
$6\frac{1}{2}$	× 9	do.	$1\frac{5}{8}$	do.	-		-	1.60	do.	
7	× 9	do.	$1\frac{3}{4}$	do.	-	-	-	1.60	do.	
$7\frac{1}{2}$	× 9	do.	$1\frac{3}{4}$	do.	-		-	1.75	do.	

Eastern Hubs, made from extra timber, 20 cents extra per set.

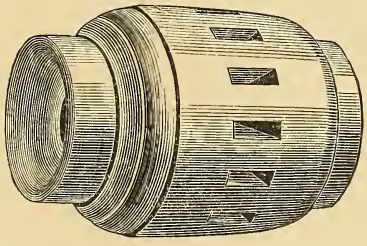
HUBS—Continued.

WAGON.



PLAIN.

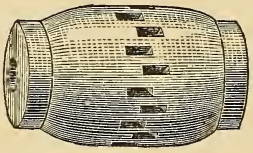
8	×	10	—Mortised for	2¼	inch spoke,	-	-		$1.80	per set.
8½	×	10	do.	2¼	do.	-	-	-	1.80	do.
8	×	11	do.	2¼	do.	-	-		1.80	do.
8½	×	11	do.	2⅜	do.	-	-	-	1.80	do.
9	×	11	do.	2⅜	do.	-	-		1.80	do.
9	×	12	do.	2½	do.	-	-	-	1.80	do.
10	×	12	do.	3	do.	-	-		2.25	do.



CUPPED.

7	×	9	—Mortised for	1¾	inch spoke,	-	-		$1.75	per set.
7½	×	9	do.	2	do.	-	-	-	1.80	do.
8	×	10	do.	2¼	do.	-	-		1.80	do.
8¼	×	10	do.	2¼	do.	-	-	-	1.80	do.
8½	×	10	do.	2¼	do.	-	-		1.80	do.
8	×	11	do.	2¼	do.	-	-	-	1.80	do.
8½	×	11	do.	2⅜	do.	-	-		1.80	do.
9	×	11	do.	2⅜	do.	-	-	-	1.80	do.
8	×	12	do.	2⅜	do.	-	-		1.80	do.
8½	×	12	do.	2⅜	do.	-	-	-	1.80	do.
9	×	12	do.	2½	do.	-	-		1.80	do.
9½	×	12	do.	2½	do.	-	-	-	2.00	do.
10	×	12	do.	3	do.	-	-		2.50	do.
10	×	13	do.	3	do.	-	-	-	2.50	do.

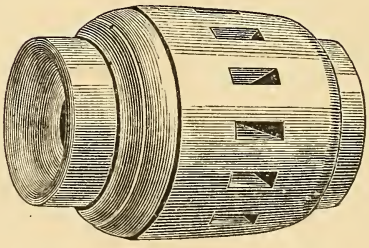
HUBS—Continued.



SULKY.

$3\frac{1}{2}$	×	6	—Mortised for	$\frac{7}{8}$	inch spokes,	-	-	80	cents	per	pair.
$3\frac{3}{4}$	×	6	do.	$\frac{7}{8}$	do.	-	-	80	do.	do.	
$3\frac{1}{2}$	×	$6\frac{1}{2}$	do.	1	do.	-	-	80	do.	do.	
4	×	$6\frac{1}{2}$	do.	1	do.	-	-	80	do.	do.	
$4\frac{1}{4}$	×	$6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	80	do.	do.	
$4\frac{1}{2}$	×	$6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	80	do.	do.	
4	×	7	do.	$1\frac{1}{8}$	do.	-	-	80	do.	do.	
$4\frac{1}{4}$	×	7	do.	$1\frac{1}{8}$	do.	-	-	80	do.	do.	
$4\frac{1}{2}$	×	7	do.	$1\frac{1}{8}$	do.	-	-	80	do.	do.	
5	×	7	do.	$1\frac{1}{4}$	do.	-	-	80	do.	do.	

Eastern Hubs, made from extra timber, 20 cents extra per set over ordinary hub.

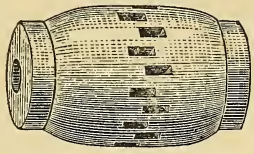


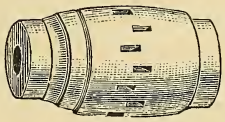
DRAY.

10	×	12	—Mortised for	3	inch spokes,	-	-	$1.10	per	pair.
10	×	13	do.	3	do.	-	-	1.10	do.	

HUBS — Continued.

BUGGY.



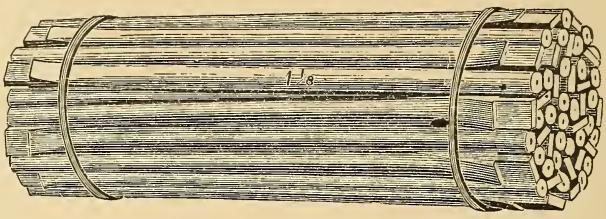


EASTERN AND DAYTON PATTERN.

3	× 6	—Mortised for	$\frac{7}{8}$	inch spokes,	-	-	-	$1.86	per set.
$3\frac{1}{2}$	× 6	do.	$\frac{7}{8}$	do.	-	-	-	1.86	do.
4	× 6	do.	1	do.	-	-		1.86	do.
$3\frac{1}{4}$	× $6\frac{1}{2}$	do.	1	do.	-	-	-	1.86	do.
$3\frac{1}{2}$	× $6\frac{1}{2}$	do.	1	do.	-	-		1.86	do.
$3\frac{3}{4}$	× $6\frac{1}{2}$	do.	1	do.	-	-	-	1.86	do.
4	× $6\frac{1}{2}$	do.	1	do.	-	-		1.86	do.
$4\frac{1}{4}$	× $6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	-	1.86	do.
$4\frac{1}{2}$	× $6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-		1.86	do.
$4\frac{3}{4}$	× $6\frac{1}{2}$	do.	$1\frac{1}{8}$	do.	-	-	-	1.86	do.
5	× $6\frac{1}{2}$	do.	$1\frac{1}{4}$	do.	-	-		1.86	do.
5	× 7	do.	$1\frac{1}{4}$	do.	-	-	-	1.86	do.
$5\frac{1}{4}$	× 7	do.	$1\frac{3}{8}$	do.	-	-		2.02	do.
$5\frac{1}{2}$	× 7	do.	$1\frac{1}{4}$	do.	-	-	-	2.15	do.
5	× $7\frac{1}{2}$	do.	$1\frac{3}{8}$	do.	-	-		1.86	do.
$5\frac{1}{4}$	× $7\frac{1}{2}$	do.	$1\frac{3}{8}$	do.	-	-	-	2.02	do.
$5\frac{1}{2}$	× $7\frac{1}{2}$	do.	$1\frac{3}{8}$	do.	-	-		2.15	do.
6	× 8	do.	$1\frac{1}{2}$	do.	-	-	-	2.28	do.

No paint, varnish or oil.

SPOKES.



ALL WHITE SECOND GROWTH HICKORY.

$\frac{7}{8}$ inch,	- - - - - -	$7.30 per set.
1 do.	- - - - - -	7.30 do.
$1\frac{1}{8}$ do.	- - - - - -	7.30 do.
$1\frac{1}{4}$ do.	- - - - - -	7.30 do.
$1\frac{3}{8}$ do.	- - - - - -	7.30 do.
$1\frac{1}{2}$ do.	- - - - - -	7.30 do.
$1\frac{5}{8}$ do.	- - - - - -	8.50 do.
$1\frac{3}{4}$ do.	- - - - - -	8.50 do.
$1\frac{7}{8}$ do.	- - - - - -	8.50 do.
2 do.	- - - - - -	8.50 do.

MIXED SECOND GROWTH HICKORY.

$\frac{7}{8}$ inch,	- - - - - -	$5.35 per set.
1 do.	- - - - - -	5.35 do.
$1\frac{1}{8}$ do.	- - - - - -	5.35 do.
$1\frac{1}{4}$ do.	- - - - - -	5.35 do.
$1\frac{3}{8}$ do.	- - - - - -	5.35 do.
$1\frac{1}{2}$ do.	- - - - - -	5.35 do.

ALL WHITE SELECTED HICKORY.

$\frac{7}{8}$ inch,	- - - - - -	$4.25 per set.
1 do.	- - - - - -	4.25 do.
$1\frac{1}{8}$ do.	- - - - - -	4.25 do.
$1\frac{1}{4}$ do.	- - - - - -	4.25 do.
$1\frac{3}{8}$ do.	- - - - - -	4.25 do.
$1\frac{1}{2}$ do.	- - - - - -	4.25 do.
$1\frac{5}{8}$ do.	- - - - - -	4.25 do.
$1\frac{3}{4}$ do.	- - - - - -	4.25 do.
$1\frac{7}{8}$ do.	- - - - - -	4.25 do.
2 do.	- - - - - -	4.25 do.

SPOKES — Continued.

RED FOREST HICKORY.

$\frac{7}{8}$ inch,	$3.60	per set.
1 do.	3.60	do.
$1\frac{1}{8}$ do.	3.60	do.
$1\frac{1}{4}$ do.	3.60	do.
$1\frac{3}{8}$ do.	3.60	do.
$1\frac{1}{2}$ do.	3.60	do.
$1\frac{5}{8}$ do.	3.60	do.
$1\frac{3}{4}$ do.	3.60	do.
$1\frac{7}{8}$ do.	3.60	do.
2 do.	3.60	do.

MIXED OR WHITE FOREST HICKORY.

$\frac{7}{8}$ inch,	$3.50	per set.
1 do.	3.50	do.
$1\frac{1}{8}$ do.	3.50	do.
$1\frac{1}{4}$ do.	3.50	do.
$1\frac{3}{8}$ do.	3.50	do.
$1\frac{1}{2}$ do.	3.50	do.
$1\frac{5}{8}$ do.	3.50	do.
$1\frac{3}{4}$ do.	3.50	do.
$1\frac{7}{8}$ do.	3.50	do.
2 do.	3.50	do.

No. 1 FOREST HICKORY.

$\frac{7}{8}$ inch,	$2.70	per set.
1 do.	2.70	do.
$1\frac{1}{8}$ do.	2.70	do.
$1\frac{1}{4}$ do.	2.70	do.
$1\frac{3}{8}$ do.	2.70	do.
$1\frac{1}{2}$ do.	2.70	do.
$1\frac{5}{8}$ do.	2.70	do.
$1\frac{3}{4}$ do.	2.70	do.
$1\frac{7}{8}$ do.	2.70	do.
2 do.	2.70	do.

SPOKES — Continued.

SULKY.

ALL WHITE SECOND GROWTH HICKORY.

36 TO THE SET.

$\frac{7}{8}$ inch,	$4.50 per set.
1 do.	4.50 do.
$1\frac{1}{8}$ do.	4.50 do.
$1\frac{1}{4}$ do.	4.50 do.

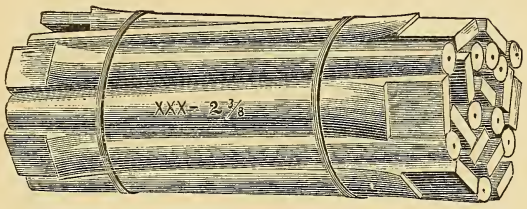
FOREST HICKORY.

36 TO THE SET.

$\frac{7}{8}$ inch,	$2.75 per set.
1 do.	2.75 do.
$1\frac{1}{8}$ do.	2.75 do.
$1\frac{1}{4}$ do.	2.75 do.

SPOKES—Continued.

WAGON.



SECOND GROWTH OAK.

1¾ inch,	$8.00 per set.
1⅞ do.	8.00 do.
2 do.	8.00 do.
2⅛ do.	8.00 do.
2¼ do.	8.00 do.
2⅜ do.	8.00 do.
2½ do.	8.00 do.

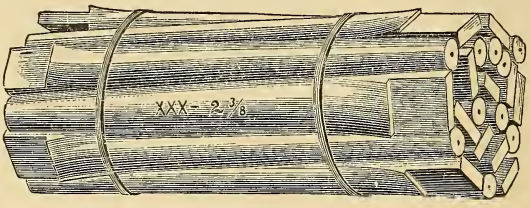
H. K. & CO.'S EXTRA SELECTED OAK.

1¾ inch,	$5.30 per set.
1⅞ do.	5.30 do.
2 do.	5.30 do.
2⅛ do.	5.30 do.
2¼ do.	5.30 do.
2⅜ do.	5.30 do.
2½ do.	5.30 do.

XXX OAK.

2 inch,	$4.00 per set.
2⅛ do.	4.00 do.
2¼ do.	4.00 do.
2⅜ do.	4.00 do.
2½ do.	4.00 do.
2⅝ do.	5.00 do.
2¾ do.	5.00 do.
3 do.	5.00 do.

SPOKES — Continued.



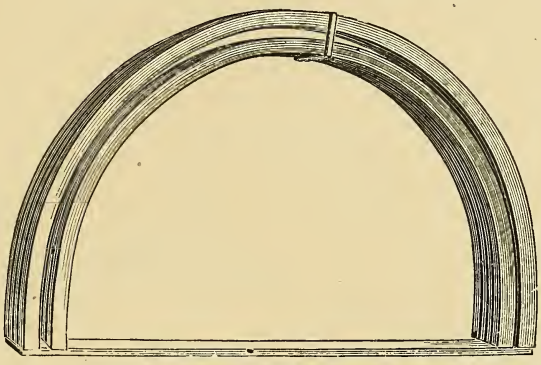
XX OAK.

2 inch,	$3.25 per set.
2⅛ do.	3.25 do.
2¼ do.	3.25 do.
2⅜ do.	3.25 do.
2½ do.	3.25 do.

No. 1 OAK.

2 inch,	$3.00 per set.
2⅛ do.	3.00 do.
2¼ do.	3.00 do.
2⅜ do.	3.00 do.
2½ do.	3.00 do.

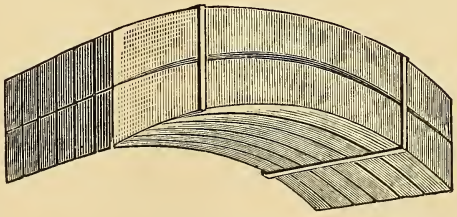
FELLOES OR RIMS.



BENT.

1 inch square,	$1.75 per set.
1⅛ do.	1.75 do.
1¼ do.	2.00 do.
1⅜ do.	2.25 do.
1½ do.	2.50 do.
1⅝ do.	2.75 do.
1¾ do.	3.00 do.
1⅞ do.	3.25 do.
2 do.	3.50 do.
2⅛ × 2 inches,	4.00 do.
2¼ × 2 do.	4.50 do.
Cart felloes, 2 × 3 inches,	3.00 do.
do. 2 × 4 do.	3.50 do.
Sulky felloes, 1, 1⅛ and 1¼ square,	1.50 do.
do. 1⅜ and 1½, do.	1.75 do.

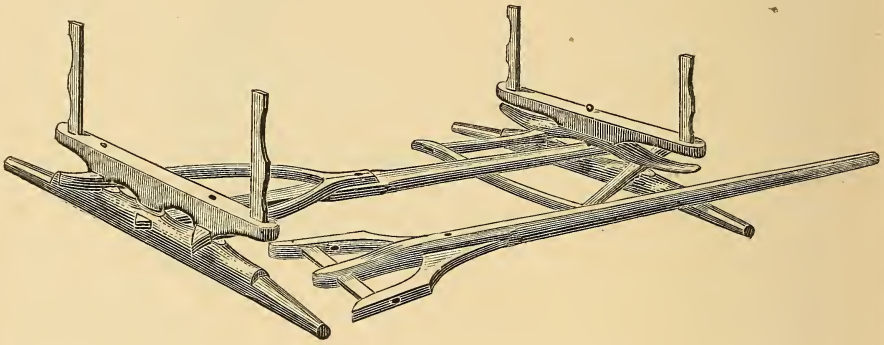
Cultivator felloes, according to size.



SAWED.

1½ inch tread,	$2.25 per set.
1¾ do.	2.25 do.
2 do.	2.25 do.
2¼ do.	5.00 do.
2½ do.	6.00 do.
2¾ do.	7.00 do.

WAGON GEARING.



FINISHED AND OILED.

Consisting of 2 axles,
2 bolsters,
1 sand board,
1 tongue, complete,
2 hawn braces,
1 reach,
2 reach braces,
1 sway bar,
4 stakes—16 pieces, - - - $20.00 per set.

ROUGH.

Consisting of 2 tongue braces,
2 hawn do.
2 reaches do.
1 sway bar,
4 stakes—11 pieces, - - - $1.80 per set.

WAGON GEARING—Continued.

HICKORY AXLES—Rough.

3 × 4—6 feet long,	$2.25 per pair.
4 × 5—6 do.	2.25 do.
4 × 5—6 ft. 6 in. long,	3.50 do.
4 × 6—6 do.	4.00 do.

WAGON TONGUES.

Ash, rough,	$9.50 per doz.

WAGON REACHES.

Ash, rough,	$4.75 per doz.

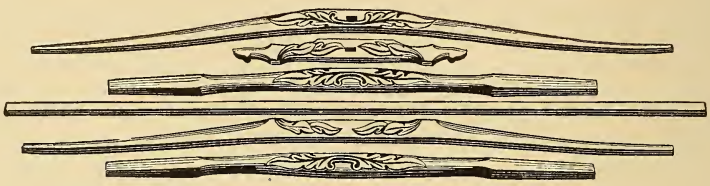
WAGON BOLSTERS.

Ash, rough,	$4.75 per doz.

SAND BOARDS.

Ash, rough,	$3.60 per doz.
Hickory do.	3.60 do.

BUGGY GEARING.



FINISHED — Second Growth Timber.

Plain, for 14 inch circle, - - - -	$4.00 per set.
Full carved, - - - - - -	6.75 do.

ROUGH — Second Growth Timber.

Consisting of 1 head block,
2 axle beds,
2 spring bars,
1 reach, - - - - $3.00 per set.

SHAFTS.

ROUGH.

Straight,	$8.00 per doz. pairs.
Bent heel,	8.75 do.
Express,	16.00 do.
Cutter,	9.00 do.
Sulky, straight,	1.70 per pair.
do. circle back,	2.00 do.

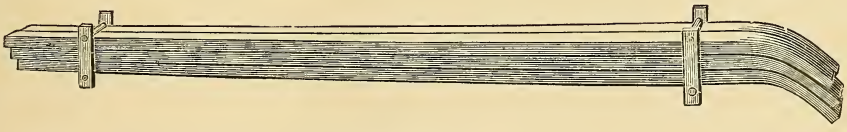
FINISHED AND OILED—With Cross Bars.

Bent heel, buggy,	$16.00 per doz. pairs.
Full circle, sulky,	6.00 per pair.

CROSS BARS.

Bent,	$1.30 per doz.

POLES.



ROUGH.

Single bend,	$8.75 per doz.
Double do.	12.00 do.

FINISHED AND OILED—With Circle.

Bent heel, single bend,	$19.00 per doz.
do. double do.	20.00 do.

NECK YOKES.

WAGON.

ROUND.

Ash, second growth timber,	36	inches long,	-	$4.00	per doz.
Hickory, do. do.	36	do.	- -	4.00	do.
do. forest timber,	36	do.	-	1.75	do.
do. second growth,	48	do.	- -	5.00	do.

BUGGY.

Ash, second growth timber,	36 to 40	inches long,	-	$4.50	per doz.
Hickory, do. do.	36 to 40	do.	- -	4.50	do.

EXPRESS.

Ash, second growth timber,	36	inches long,	-	$4.50	per doz.
Hickory, do. do.	36	do.	- -	4.50	do.

EVENERS.

WAGON.

Ash timber,	36	inches long,	- - -	$4.50	per doz.
Hickory do.	36	do.	- - - - -	4.50	do.

BUGGY.

Ash timber,	36	inches long,	- - -	$4.00	per doz.
Hickory do.	36	do.	- - - - -	4.00	do.

SINGLETREES.

WAGON.

OVAL.

Ash, second growth timber,	36	inches long,	-	$4.00	per doz.
Hickory, do. do.	36	do.	- -	4.00	do.
do. forest timber,	36	do.	-	1.75	do.

ROUND.

Ash, second growth timber,	36	inches long,	-	$4.00	per doz.
Hickory, do. do.	36	do.	- -	4.00	do.
do. forest timber,	36	do.	-	1.75	do.
do. selected timber,	42	do.	- -	4.00	do.

BUGGY.

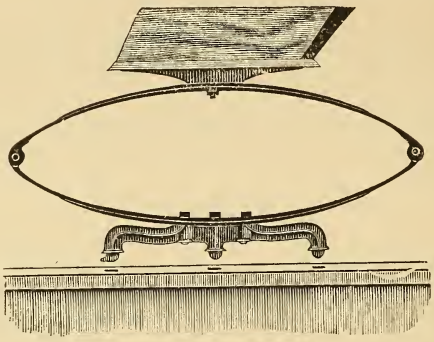
Ash, second growth timber,	36 to 40	inches long,	-	$4.50	per doz.
Hickory, do. do.	36 to 40	do.	- -	4.50	do.

EXPRESS.

Ash, second growth timber,	36	inches long,		$4.50	per doz.
Hickory, do. do.	36	do.	- -	4.50	do.

BUGGY SEATS.

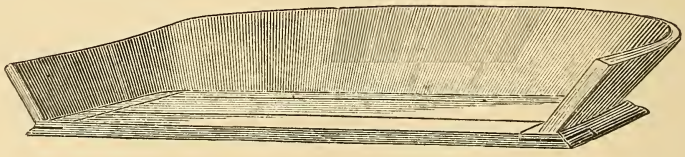
IRON CORNERS.



TOPLIFF AND ELY'S PATENT.

2 ft. 6 in. long,	$3.50 each.
2 ft. 8 in. do.	3.50 do.
2 ft. 9 in. do.	3.50 do.
2 ft. 10 in. do.	3.50 do.
2 ft. 11 in. do.	3.50 do.
3 ft. do.	3.50 do.
3 ft. 1 in. do.	3.50 do.
3 ft. 2 in. do.	3.50 do.
3 ft. 3 in. do.	3.50 do.

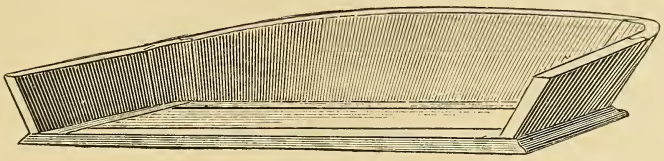
PATENT SOLID BENT BOARD.



HUBBELL'S PATENT.

2 ft. 6 in. long,	$4.00 each.
2 ft. 8 in. do.	4.00 do.
2 ft. 9 in. do.	4.00 do.
2 ft. 10 in. do.	4.00 do.
2 ft. 11 in. do.	4.00 do.
3 ft. do.	4.00 do.
3 ft. 1 in. do.	4.00 do.
3 ft. 2 in. do.	4.00 do.
3 ft. 3 in. do.	4.00 do.

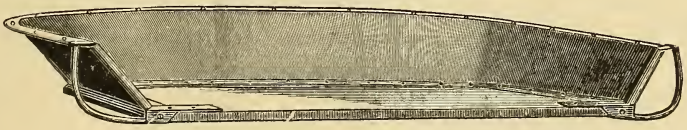
BUGGY SEATS—Continued.



PIECED BACK.

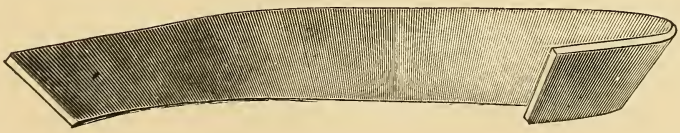
2 ft. 6 in. long,	$3.50 each.
2 ft. 8 in. do.	3.50 do.
2 ft. 9 in. do.	3.50 do.
2 ft. 10 in. do.	3.50 do.
2 ft. 11 in. do.	3.50 do.
3 ft. do.	3.50 do.
3 ft. 1 in. do.	3.50 do.
3 ft. 2 in. do.	3.50 do.
3 ft. 3 in. do.	3.50 do.

PATENT SOLID IRON RAIL.



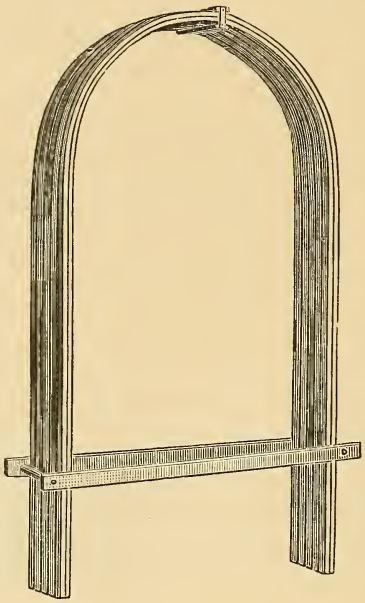
GRAHAM'S PATENT.

2 ft. 6 in. long,	$4.00 each.
2 ft. 8 in. do.	4.00 do.
2 ft. 9 in. do.	4.00 do.
2 ft. 10 in. do.	4.00 do.
2 ft. 11 in. do.	4.00 do.
3 ft. do.	4.00 do.
3 ft. 1 in. do.	4.00 do.
3 ft. 2 in. do.	4.00 do.
3 ft. 3 in. do.	4.00 do.



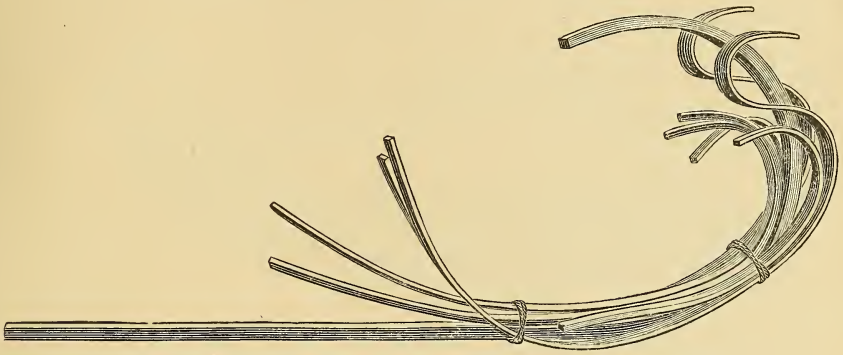
Patent Solid Bent Board Rails, - - - $1.65 each.

BENT BOWS.



Buggy, four pieces, - - - - -	$1.20 per set.
Express, do. - - - - -	1.50 do.
Grocery, five pieces, - - - - -	1.50 do.
Wagon, square top, five pieces, - - - - -	1.50 do.
do. round top, do. - - -	1.25 do.

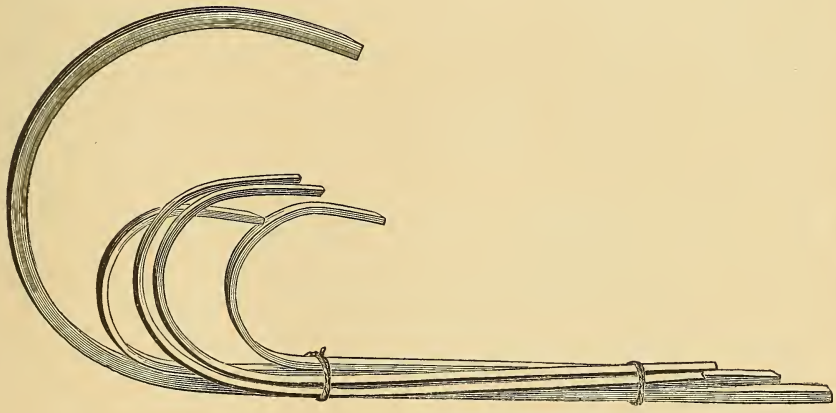
BENT CUTTER STUFF.



INCLUDING RUNNERS, RAVES AND FENDERS.

SWELL BODY.

For two seats,	$5.00 per set.
For one seat,	4.50 do.



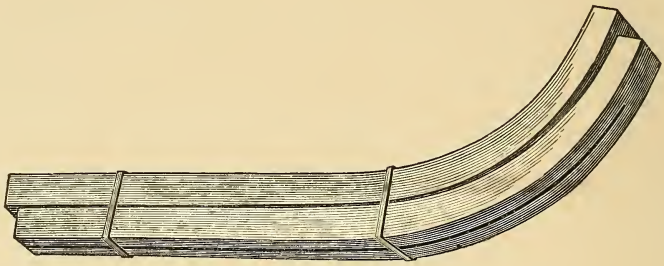
SQUARE BODY.

For two seats,	$4.00 per set.
For one seat,	3.50 do.
Shafts,	1.00 per pair.
Raves and Fenders,	1.50 do.
Knees and Beams, in rough,	1.00 per set.

CUTTER RUNNERS.

1 to 1¼ inches deep,	$1.75 per pair.
1½ do.	2.00 do.

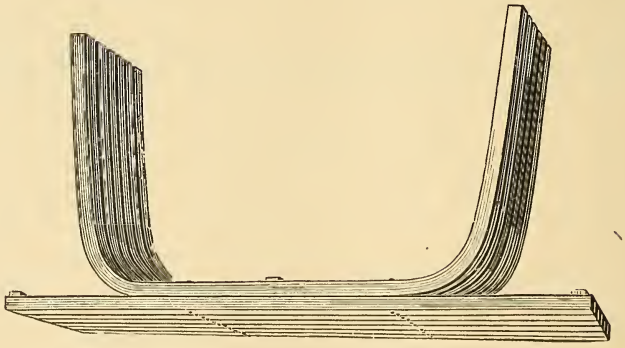
BENT CUTTER STUFF—Continued.



SOLID BENT BOB RUNNERS.

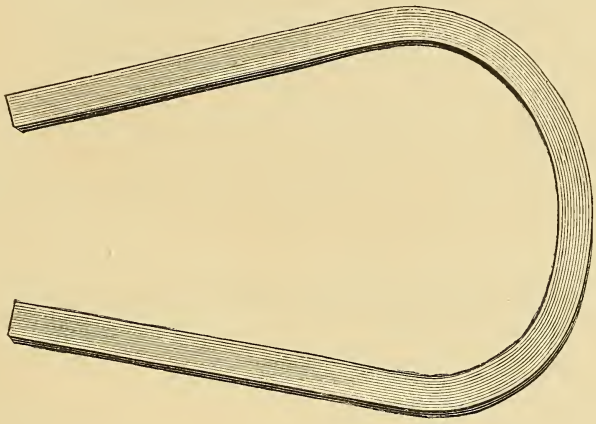
2 inches deep,	-	$3.00 per set.
2¼ do.	-	3.00 do.
2½ do.	-	3.25 do.
2¾ do.	-	3.50 do.
3 do.	-	3.75 do.
3½ do.	-	4.00 do.
4 do.	-	4.75 do.
Extra long,	-	3.00 per pr.

KNEES AND BEAMS.



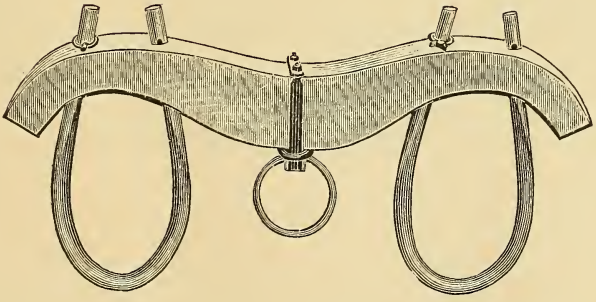
Solid bent centre knees and beam, 3 to the set, - $2.50 per set.

BENT HAWNS.



Solid bend, - - - - - - $1.25 each.

OX YOKES.



Finished and ironed, with bows, - - - each.

OX BOWS.

Hickory, - - - - - per doz pairs.

HANDLES.

GOLD MINER'S.

Second growth, all white, extra quality,	36	inches long,		$4.00	per doz.
do.	do.	do.	32	do.	4.00 do.
do.	do.	do.	30	do.	4.00 do.

SLEDGE.

Second growth, 36	inches long,		$4.00	per doz.
do.	30	do.	3.35	do.

AXE.

Shaved, extra selected,		$5.00	per doz.
Turned, second growth,		4.35	do.
do.	No. 2,	2.50	do.
do.	No. 1,	2.25	do.

ADZE.

Second growth, all white,	4.00	per doz.

HAMMER.

Second growth, 24	inches long,		$3.35	per doz.
do.	20	do.	2.70	do.
do.	18	do.	2.50	do.
do.	16	do.	2.00	do.

HANDLES—Continued.

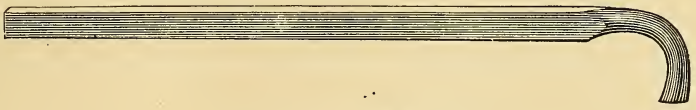
COAL MINER'S.

Second growth, all white,	36	inches long,	- -	$4.00	per doz.
do. do.	32	do.	- -	4.00	do.

RAILROAD.

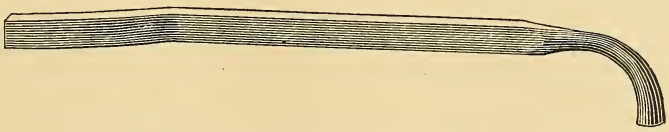
Second growth hickory,	36	inches long,	- -	$4.00	per doz.
do. ash,	36	do.	- -	4.00	do.
No. 1,	36	do.	- -	2.65	do.

PLOW HANDLES.



SINGLE BEND.

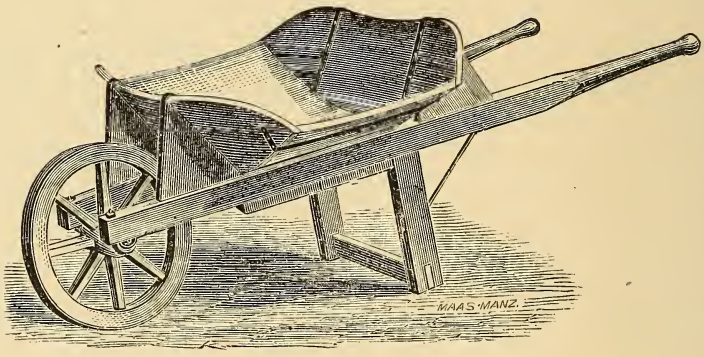
Single bend, - - - - - 40 cents per pair.



DOUBLE BEND.

Double bend, - - - - 50 cents per pair.

WHEEL BARROWS.



Railroad, - - - - - -	per doz.
Canal, - - - - - - -	do.
Garden, - - - - - -	each.

APPENDIX.*

IRON.

The foreign substances which iron contains modify its essential properties. *Carbon* adds to its hardness, but destroys some of its qualities, and produces Cast Iron or Steel according to the proportion it contains. *Sulphur* renders it fusible, difficult to weld, and brittle when heated or "*hot short*." *Phosphorus* renders it "*cold short*," but may be present in the proportion of $\frac{2}{1000}$ to $\frac{3}{1000}$ without affecting injuriously its tenacity. *Antimony*, *Arsenic* and *Copper* have the same effect as sulphur, the last in a greater degree.

CAST IRON.

The process of making cast iron depends much upon the description of fuel used; whether charcoal, coke, bituminous or anthracite coals. A larger yield from the same furnace, and a great economy in fuel, are effected by the use of a *hot blast*. The greater heat thus produced causes the iron to combine with a larger percentage of foreign substances.

Cast iron for purposes requiring great strength should be smelted with a *cold blast*. *Pig iron*, according to the proportion of carbon which it contains, is divided into *Foundry Iron* and *Forge Iron*, the latter adapted only to conversion into malleable iron; while the former, containing the largest proportion of carbon, can be used either for castings or bars.

There are many varieties of cast iron, differing by almost insensible shades; the two principal divisions are *gray* and *white*, so termed from the color of their fracture. Their properties are very different.

Gray Iron is softer and less brittle than white iron; it is in a slight degree malleable and flexible, and is not sonorous; it can be easily drilled or turned in a lathe, and does not resist the file. It has a brilliant fracture, of a gray, or sometimes a bluish gray color; the color is lighter as the grain becomes closer, and its hardness increases at the same time. It melts at a lower heat than white iron, and preserves its fluidity longer. The color of the fluid metal is red, and deeper in proportion as the heat is lower; it does not adhere to the ladle; it fills the molds well, contracts less, and contains fewer cavities than white iron; the edges of its castings are sharp, and the surfaces smooth and convex. A medium-sized grain, bright gray color, fracture sharp to the touch, and a close, compact texture, indicate a good quality of iron. A grain, either very large or very small, a dull, earthy aspect, loose texture, dissimilar crystals, mixed together, indicate an inferior quality.

Gray iron is used for machinery and ordnance purposes where the pieces are to be bored or fitted. Its tenacity and specific gravity are *diminished* by annealing. Its mean specific gravity is 7.2.

White Iron is very brittle and sonorous; it resists the file and the chisel, and is susceptible of high polish; the surface of its castings is concave; the fracture presents a silvery appearance, generally fine-grained and compact, sometimes radiating or lamellar. When melted it is white, and throws off a great number of sparks, and its qualities are the reverse of those of gray iron; it is, therefore, unsuitable for machinery purposes. Its tenacity is *increased*, and its specific gravity *diminished* by annealing. Its mean specific gravity is 7.5.

* *Compiled from* HASWELL *and other sources.*

Mottled Iron is a mixture of white and gray; it has a spotted appearance; it flows well and with few sparks; its castings have a plane surface, with edges slightly rounded. It is suitable for shot, shells, etc.

A fine mottled iron is the only kind suitable for castings which require great strength, such as beam centres, cylinders and cannon. The kind of mottle will depend much upon the size of the casting.

Besides these general divisions, the different varieties of pig iron are more particularly distinguished by numbers, according to their relative hardness.

No. 1 is the softest iron, possessing in the highest degree the qualities belonging to gray iron; it has not much strength, but, on account of its fluidity when melted, and of its mixing advantageously with old or scrap iron, and with the harder kinds of cast iron, it is of great use to the founder, and commands the highest price.

No. 2 is harder, closer grained, and stronger than No. 1; it has a gray color, and considerable lustre. It is the character of iron most suitable for shot and shells.

No. 3 is stlll harder than No. 2. Its color is gray, but inclining to white; it has considerable strength, but it is principally used for mixing with other kinds of iron.

No. 4 is *bright* iron; No. 5, *mottled;* and No. 6, *white*, which is unfit for general use by itself.

The qualities of these various descriptions depend upon the proportion of carbon, and upon the state in which it exists in the metal; in the darker kinds of iron, where the proportion is sometimes 7 per cent., it exists partly in the state of graphite or plumbago, which makes the iron soft. In white iron, the carbon is thoroughly combined with the metal, as in steel.

Cast iron frequently retains a portion of foreign ingredients from the ore, such as earths or oxides of other metals, and sometimes sulphur and phosphorus, which are all injurious to its quality. Sulphur hardens the iron, and, unless in a very small proportion, destroys its tenacity.

These foreign substances, and also a portion of the carbon, are separated by melting the iron in contact with air, and soft iron is thus rendered harder and stronger. The effect of remelting varies with the nature of the iron and the character of the ore from which it has been extracted; that from the hard ores, such as the magnetic oxides, undergoes less alteration than that from the hematites, the latter being sometimes changed from No. 1 to *white* by a single remelting in an air furnace.

The color and texture of cast iron depend greatly upon the volume of the casting and the rapidity of its cooling; a small casting, which cools quickly, is almost always white, and the surface of large castings partakes more of the qualities of white metal than the interior.

All cast iron expands at the moment of becoming solid, and contracts in cooling; gray iron expands more and contracts less than other iron.

The contraction is about $\frac{1}{100}$ for gray and strongly-mottled iron, or $\frac{1}{8}$ of an inch per foot.

Remelting iron improves its tenacity; thus, a mean of 14 cases for two fusions, gave, for 1st fusion, a tenacity of 29 284 lbs.; for 2d fusion, 33 790 lbs. For 2 cases—for 1st fusion, 15 129 lbs.; for 2d fusion, 35 786 lbs.

WROUGHT IRON.

Wrought iron is made from the pig iron in a *Bloomery Fire* or in a *Puddling Furnace*—generally in the latter. The process consists in melting it and keeping it exposed to a great heat, constantly stirring the mass, bringing every part of it under the action of the flame until it loses its remaining carbon, when it becomes malleable iron. When, however, it is desired to obtain iron of the best quality, the pig iron should be refined.

Refining.—This operation deprives the iron of a considerable portion of its carbon; it is effected in a *Blast Furnace*, where the iron is melted by means of charcoal or coke, and exposed for some time to the action of a great heat; the metal is then run into a cast-iron mold, by which it is formed into a large bread plate. As soon as the surface of the plate is chilled, cold water is poured on to render it brittle.

The *Bloomery* resembles a large forge fire, where charcoal and a strong blast are used; and the refined metal or the pig iron, after being broken into pieces of the proper size, is placed before the blast, directly in contact with charcoal; as the metal fuses, it falls into a cavity left for that purpose below the blast, where the bloomer works it into the shape of a ball, which he places again before the blast, with fresh charcoal; this operation is generally again repeated, when the ball is ready for the *Shingler.*

The *Puddling Furnace* is a reverbatory furnace, where the flame of bituminous coal is brought to act directly upon the metal. The metal is first melted; the puddler then stirs it, exposing each portion in turn to the action of the flame, and continues this as long as he is able to work it. When it has lost its fluidity, he forms it into balls, weighing from 80 to 100 lbs., which are next passed to the shingler.

Shingling is performed in a strong squeezer, or under the trip-hammer. Its object is to press out as perfectly as practicable the liquid cinder which the ball still contains; it also forms the ball into shape for the puddle rolls. A heavy hammer, weighing from 6 to 7 tons, effects this object most thoroughly, but not so cheaply as the squeezer The ball receives from 15 to 20 blows of a hammer, being turned from time to time as required; it is now termed a *Bloom*, and is ready to be rolled or hammered; or the ball is passed once through the squeezer, and is still hot enough to be passed through the puddle rolls.

Puddle Rolls.—By passing through different grooves in these rolls, the bloom is reduced to a rough bar from three to four feet in length, its name conveying an idea of its condition, which is rough and imperfect.

Piling.—To prepare rough bars for this operation, they are cut, by a pair of shears, into such lengths as are best adapted to the size of the finished bar required; the sheared bars are then piled one over the other, according to the volume required, when the pile is ready for balling.

Balling.—This operation is performed in the balling furnace, which is similar to the puddling furnace, except that its bottom or hearth is made up, from time to time, with sand, it is used to give a welding heat to the piles to prepare them for rolling.

Finishing Rolls.—The balls are passed successively between rollers of various forms and dimensions, according to the shape of the finished bar required.

The quality of the iron depends upon the description of pig iron used, the skill of the puddler, and the absence of deleterious substances in the furnace.

The strongest cast irons do not produce the strongest malleable iron.

For many purposes, such as sheets for tinning, best boiler-plates, and bars for converting into steel, *charcoal iron* is used exclusively; and, generally, this kind of iron is to be relied upon, for strength and toughness, with greater confidence than any other, though iron of superior quality is made from pigs made with other fuel, and with a hot blast. Iron for gun-barrels has been lately made from anthracite hot-blast pigs.

Iron is improved in quality by judicious working, reheating it, and hammering or rolling; other things being equal, the best iron is that which has been wrought the most.

STEEL.

Steel is a compound of Iron and Carbon, in which the proportion of the latter is from 1 to 5 per cent., and even less in some kinds. Steel is distinguished from iron by its fine grain, and by the action of diluted nitric acid, which leaves a black spot upon steel, and upon iron a spot which is lighter colored in proportion to the carbon it contains.

There are many varieties of steel, the principal of which are:

Natural Steel, obtained by reducing rich and pure descriptions of iron ore with charcoal, and refining the cast iron, so as to deprive it of a sufficient portion of carbon to bring it to a malleable state. It is used for files and other tools.

Indian Steel, termed *Wootz*, is said to be a natural steel, containing a small portion of other metals.

Blistered Steel, or Steel of Cementation, is prepared by the direct combination of iron and carbon. For this purpose, the iron in bars is put in layers, alternating with powdered charcoal, in a close furnace, and exposed for seven or eight days to a heat of about 9000°, and then put to cool for a like period. The bars, on being taken out, are covered with blisters, have acquired a brittle quality, and exhibit in the fracture a uniform crystalline appearance. The degree of carbonization is varied according to the purposes for which the steel is intended, and the best qualities of iron (Russian and Swedish) are used for the finest kinds of steel.

Tilted Steel is made from blistered steel moderately heated, and subjected to the action of a tilt hammer, by which means its tenacity and density are increased.

Shear Steel is made from blistered or natural steel, refined by piling thin bars into fagots, which are brought to a welding heat in a reverberatory furnace, and hammered or rolled again into bars; this operation is repeated several times to produce the finest kinds of shear steel, which are distinguished by the names of *half shear*, *single shear* and *double shear*, or steel of 1, 2, or 3 *marks*, etc., according to the number of times it has been piled

Cast Steel is made by breaking blistered steel into small pieces, and melting it in close crucibles, from which it is poured into iron molds; the ingot is then reduced to a bar by hammering or rolling. Cast steel is the best kind of steel, and best adapted for most purposes; it is known by a very fine, even, and close grain, and a silvery homogenous fracture; it is very brittle, and acquires extreme hardness, but is difficult to weld without the use of a flux. The other kinds of steel have a similar appearance to cast steel, but the grain is coarser and less homogeneous; they are softer and less brittle, and weld more readily. A fibrous or lamellar appearance in the fracture indicates an imperfect steel. A material of great toughness and elasticity, as well as hardness, is made by forging together steel and iron, forming the celebrated *damasked steel*, which is used for sword-blades, springs, etc.; the damask appearance of which is produced by a diluted acid, which gives a black tint to the steel, while the iron remains white.

Various fancy steels, or alloys of steel with *silver*, *platinum*, *rhodium*, and *aluminum*, have been made with a view to imitating the Damascus steel, wootz, etc.; and improving the fabrication of some of the finer kinds of surgical and other instruments.

Properties of Steel.—After being tempered, it is not easily broken; it welds readily; it does not crack or split; it bears a very high heat, and preserves the capability of hardening after repeated working.

Hardening and Tempering.—Upon these operations the quality of manufactured steel in a great measure depends.

Hardening is effected by heating the steel to a cherry-red, or until the scales of oxide are loosened on the surface, and plunging it into a liquid, or placing it in contact with some cooling substance; the degree of hardness depends upon the heat and

the rapidity of cooling. Steel is thus rendered so hard as to resist the hardest files, and it becomes at the same time extremely brittle. The degree of heat, and the temperature and nature of the cooling medium, must be chosen with reference to the quality of the steel and the purpose for which it is intended. Cold water gives a greater hardness than oils or other fatty substances, sand, wet-iron scales, or cinders, but an inferior degree of hardness to that given by acids. Oil, tallow, etc., prevent the cracks which are caused by too rapid cooling. The lower the heat at which the steel becomes hard, the better.

Tempering.—Steel in its hardest state being too brittle for most purposes, the requisite strength and elasticity are obtained by tempering—or, *letting down the temper*, as it is termed—which is performed by heating the hardened steel to a certain degree and cooling it quickly. The requisite heat is usually ascertained by the color which the surface of the steel assumes from the film of oxide thus formed. The degrees of heat to which these several colors correspond are as follows:

At 430°, a very faint yellow. At 450°, a pale straw color.	Suitable for hard instruments; as hammer faces, drills, etc.
At 470°, a full yellow. At 490°, a brown color.	For instruments requiring hard edges without elasticity; as shears, scissors, turning tools, etc.
At 510°, brown, with purple spots. At 538°, purple.	For tools for cutting wood and soft metals; such as plane-irons, knives, etc.
At 550°, dark blue. At 560°, full blue.	For tools requiring strong edges without extreme hardness; as cold-chisels, axes, cutlery, etc.
At 600°, grayish-blue, verging on black.	For spring-temper, which will bend before breaking; as saws, sword-blades, etc.

If the steel is heated higher than this, the effect of the hardening process is destroyed.

CASE-HARDENING.

This operation consists in converting the surface of wrought iron into steel, by cementation, for the purpose of adapting it to receive a polish or to bear friction, etc.; this is effected by heating iron to a cherry-red, in a close vessel, in contact with carbonaceous materials, and then plunging it into cold water. Bones, leather, hoofs and horns of animals are generally used for this purpose, after having been burned or roasted so that they can be pulverized. Soot is also frequently used.

WOOD, TIMBER, Etc.

Selection of Standing Trees.—Wood grown in a moist soil is lighter, and decays sooner than that grown in dry, sandy soil.

The best timber is that grown in a dark soil intermixed with gravel. Poplar, cypress, willow, and all others which grow best in a wet soil are exceptions.

The hardest and densest woods, and the least subject to decay, grow in warm climates; but they are more liable to split and warp in seasoning.

Trees grown upon plains, or in the centre of forests, are less dense than those from the edge of a forest, from the side of a hill, or from open ground.

Trees (in the United States) should be selected in the latter part of July, or first part of August; for at this season the leaves of the sound healthy trees are fresh and green, while those of the unsound are beginning to turn yellow. A sound, healthy tree is recognized by its top branches being well leaved, the bark even and of a uniform color. A rounded top, few leaves, some of them turned yellow, a rougher bark than common, covered with parasitic plants, and with streaks or spots upon it, indicate

a tree upon the decline. The decay of branches, and the separation of bark from the wood, are infallible indications that the wood is impaired.

Felling Timber.—The most suitable time for felling timber is in midwinter and in midsummer. Recent experiments indicate the latter season and in the month of July.

A tree should be allowed to attain full maturity before being felled. Oak matures at 75 to 100 years and upward, according to circumstances. The age and rate of growth of a tree are indicated by the number and width of the rings of annual increase which are exhibited in a cross section.

A tree should be cut as near to the ground as practicable, as the lower part furnishes the best timber.

Dressing Timber.—As soon as a tree is felled, it should be stripped of its bark, raised from the ground, the sap-wood taken off, and the timber reduced to its required dimensions.

Inspection of Timber.—The quality of wood is in some degree indicated by its color, which should be nearly uniform in the heart, a little deeper toward the centre, and free from sudden transitions of color. White spots indicate decay. The sap-wood is known by its white color; it is next to the bark, and very soon rots.

Defects of Timber.—*Wind-shakes* are circular cracks separating the concentric layers of wood from each other. It is a serious defect.

Splits, checks and cracks, extending toward the centre, if deep and strongly marked, render the timber unfit for use, unless the purpose for which it is intended will admit of its being split through them.

Brash-wood is generally consequent upon the decline of the tree from age. The wood is porous, of a reddish color, and breaks short, without splinters.

Belted timber is that which has been killed before being felled, or which has died from other causes. It is objectionable.

Knotty timber is that containing many knots, though sound; usually of stunted growth.

Twisted wood is when the grain of it winds spirally; it is unfit for long pieces.

Dry-rot.—This is indicated by yellow stains. Elm and beech are soon affected, if left with the bark on.

Large or decayed knots injuriously affect the strength of timber.

SEASONING AND PRESERVING TIMBER.

Timber freshly cut contains about 37 to 48 per cent. of liquids. By exposure to the air in seasoning one year, it loses from 17 to 25 per cent., and when seasoned it yet retains from 10 to 15 per cent.

Timber of large dimensions is improved and rendered less liable to warp and crack in being seasoned by immersion in water for some weeks.

For the purpose of seasoning, timber should be piled under shelter, and be kept dry; it should have a free circulation of air about it, without being exposed to strong currents. The bottom pieces should be placed upon skids, which should be free from decay, raised not less than 2 feet from the ground; a space of an inch should intervene between the pieces of the same horizontal layers, and slats or piling-strips placed between each layer, one near each end of the pile, and others at short distances, in order to keep the timber from winding. These strips should be one over the other, and in large piles should not be less than 1 inch thick. Light timber may be piled in the upper portion of the shelter, heavy timber upon the ground floor. Each pile should contain but one description of timber. The piles should be at least 2½ feet apart.

Timber should be repiled at intervals, and all pieces indicating decay should be removed, to prevent their affecting those which are still sound.

Timber houses are best provided with blinds, which keep out rain and snow, but which can be turned to admit air in fine weather, and they should be kept entirely free from any pieces of decayed wood.

The gradual mode of seasoning is the most favorable to the strength and durability of timber, but various methods have been proposed for hastening the process. For this purpose, *steaming* timber has been applied with success; and the results of experiments of various processes of saturating timber with a solution of *corrosive sublimate* and *antiseptic* fluids are very satisfactory. This process hardens and seasons wood, at the same time that it secures it from dry-rot and from the attacks of worms *Kiln-drying* is serviceable only for boards and pieces of small dimensions, and is apt to cause cracks and to impair the strength of wood, unless performed very slowly, *Charring* or *painting* is highly injurious to any but seasoned timber, as it effectually prevents the drying of the inner part of the wood, in consequence of which fermentation and decay soon take place.

Timber piled in badly-ventilated sheds is apt to be attacked with the *common-rot*. The first outward indications are yellow spots upon the ends of the pieces, and a yellowish dust in the checks and cracks, particularly where the pieces rest upon the piling-strips.

Timber requires from 2 to 8 years to be seasoned thoroughly, according to its dimensions. It should be worked as soon as it is thoroughly dry, for it deteriorates after that time.

Oak timber loses one-fifth of its weight in seasoning, and about one-third of its weight in becoming perfectly dry Seasoning is the extraction or dissipation of the vegetable juices and moisture, or the solidification of the albumen When wood is exposed to currents of air at a high temperature, the moisture evaporates too rapidly, and the wood cracks; and when the temperature is high and sap remains, it ferments. and dry-rot ensues.

Timber is subject to *Common-rot* or *Dry-rot*, the former occasioned by alternate exposure to moisture and dryness. The progress of this decay is from the exterior; hence the covering of the surface with paint, tar, etc., is a preservative.

Painting and charring green timber hastens its decay

Dry or Sap-rot is inherent in timber, and it is occasioned by the putrefaction of the vegetable albumen. Sap wood contains a large proportion of fermentable elements Insects attack wood for the sugar or gum contained in it, and *Fungi* subsist upon the albumen of wood; hence, to arrest dry-rot, the albumen must be either extracted or solidified.

In the seasoning of timber naturally there is required a period of from 2 to 4 years. Immersion in water facilitates seasoning by solving the sap.

The most effective method of preserving timber is that of expelling or exhausting its fluids, solidifying its albumen, and introducing an antiseptic liquid.

The strength of impregnated timber is not reduced, and its *resilience* is improved.

In desiccating timber by expelling its fluids by heat and air, its strength is increased fully 15 per cent.

In coating unseasoned timber with creosote, tar, etc., the fluids are retained, and decay facilitated thereby

When timber is saturated with creosote, tar, antiseptics, etc., it is also preserved from the attack of worms. Jarrow wood, from Australia, is not subjected to their attack.

The condition of timber, as to its soundness or decay, is readily recognized when struck a quick blow.

Timber that has been for a long time immersed in water, when brought into the air and dried, becomes brashy and useless.

Timber may be partially seasoned by being boiled or steamed.

VALUE OF IRON, PER GROSS TON,

AT FROM 2 TO 12½ CENTS PER LB.

2	44.80	4 1/8	92.40	6 1/4	140.00	8 3/8	187.60	10 1/2	235.20
2 1/8	47.60	4 1/4	95.20	6 3/8	142.80	8 1/2	190.40	10 5/8	238.00
2 1/4	50.40	4 3/8	98.00	6 1/2	145.60	8 5/8	193.20	10 3/4	240.80
2 3/8	53.20	4 1/2	100.80	6 5/8	148.40	8 3/4	196.00	10 7/8	243.60
2 1/2	56.00	4 5/8	103.60	6 3/4	151.20	8 7/8	198.80	11	246.40
2 5/8	58.80	4 3/4	106.40	6 7/8	154.00	9	201.60	11 1/8	249.20
2 3/4	61.60	4 7/8	109.20	7	156.80	9 1/8	204.40	11 1/4	252.00
2 7/8	64.40	5	112.00	7 1/8	159.60	9 1/4	207.20	11 3/8	254.80
3	67.20	5 1/8	114.80	7 1/4	162.40	9 3/8	210.00	11 1/2	257.60
3 1/8	70.00	5 1/4	117.60	7 3/8	165.20	9 1/2	212.80	11 5/8	260.40
3 1/4	72.80	5 3/8	120.40	7 1/2	168.00	9 5/8	215.60	11 3/4	263.20
3 3/8	75.60	5 1/2	123.20	7 5/8	170.80	9 3/4	218.40	11 7/8	266.00
3 1/2	78.40	5 5/8	126.00	7 3/4	173.60	9 7/8	221.20	12	268.80
3 5/8	81.20	5 3/4	128.80	7 7/8	176.40	10	224.00	12 1/8	271.60
3 3/4	84.00	5 7/8	131.60	8	179.20	10 1/8	226.80	12 1/4	274.40
3 7/8	86.80	6	134.40	8 1/8	182.00	10 1/4	229.60	12 3/8	277.20
4	89.60	6 1/8	137.20	8 1/4	184.80	10 3/8	232.40	12 1/2	280.00

CIRCUMFERENCE OF CIRCLES.

FOR BOILER-MAKERS' CONVENIENCE.

Diameter, Inches.	Circumference, Inches.	Diameter, Inches.	Circumference, Inches.	Diameter, Inches.	Circumference, Inches.
12	37.69	36	113	60	188.4
14	43.68	38	119.3	62	184.8
16	50.26	40	125.6	64	201
18	56.54	42	121.9	66	207.3
20	62.85	44	138.2	68	213.6
22	69.11	46	144.5	70	219.9
24	75.39	48	150.7	72	226.1
26	81.68	50	157	74	232.4
28	87.96	52	163.3	76	238.7
30	94.24	54	169.9	78	245.0
32	100.5	56	175.9	80	251.3
34	106.8	58	182.2		

Boiler-makers usually add one inch to length of iron for the *take up* in rolling; also two inches for each lap.

WEIGHT OF SQUARE ROLLED IRON.

FROM $\frac{1}{16}$ INCH TO 9½ INCHES.

One Foot in Length.

Side.	Weight.	Side.	Weight.	Side.	Weight.	Side.	Weight.
Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.
$\frac{1}{16}$	.013	$\frac{7}{8}$	11.883	$\frac{7}{8}$	50.756	$\frac{7}{8}$	116 671
$\frac{1}{8}$	.053	2.	13.52	4.	54.084	6.	121.664
$\frac{3}{16}$	.118	$\frac{1}{8}$	15.263	$\frac{1}{8}$	57.517	$\frac{1}{4}$	132.04
$\frac{1}{4}$	.211	$\frac{1}{4}$	17.112	$\frac{1}{4}$	61.055	$\frac{1}{2}$	142.816
$\frac{3}{8}$	.475	$\frac{3}{8}$	19.066	$\frac{3}{8}$	64.7	$\frac{3}{4}$	154.012
$\frac{1}{2}$	.845	$\frac{1}{2}$	21.12	$\frac{1}{2}$	68.448	7.	165 632
$\frac{5}{8}$	1.32	$\frac{5}{8}$	23.292	$\frac{5}{8}$	72.305	$\frac{1}{4}$	177.672
$\frac{3}{4}$	1.901	$\frac{3}{4}$	25.56	$\frac{3}{4}$	76.264	$\frac{1}{2}$	190.136
$\frac{7}{8}$	2.588	$\frac{7}{8}$	27.939	$\frac{7}{8}$	80.333	$\frac{3}{4}$	203.024
1.	3.38	3.	30.416	5.	84 48	8.	216.336
$\frac{1}{8}$	4.278	$\frac{1}{8}$	33.01	$\frac{1}{8}$	88.784	$\frac{1}{4}$	230 068
$\frac{1}{4}$	5.28	$\frac{1}{4}$	35.704	$\frac{1}{4}$	93.168	$\frac{1}{2}$	244.22
$\frac{3}{8}$	6.39	$\frac{3}{8}$	38.503	$\frac{3}{8}$	97.657	$\frac{3}{4}$	258.8
$\frac{1}{2}$	7.604	$\frac{1}{2}$	41.408	$\frac{1}{2}$	102.24	9.	273.792
$\frac{5}{8}$	8.926	$\frac{5}{8}$	44.418	$\frac{5}{8}$	106.953	$\frac{1}{4}$	289.22
$\frac{3}{4}$	10.352	$\frac{3}{4}$	47.534	$\frac{3}{4}$	111.756	$\frac{1}{2}$	305.056

WEIGHT OF ROUND ROLLED IRON.

FROM $\frac{1}{16}$ INCH TO 12 INCHES IN DIAMETER.

One Foot in Length.

Dia.	Weight.	Dia.	Weight.	Dia.	Weight.	Dia.	Weight.
Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.
$\frac{1}{16}$	.01	$\frac{1}{4}$	13.44	$\frac{5}{8}$	56.788	$\frac{1}{2}$	149.328
$\frac{1}{8}$	.041	$\frac{3}{8}$	14.975	$\frac{3}{4}$	59.9	$\frac{3}{4}$	159.456
$\frac{3}{16}$	.093	$\frac{1}{2}$	16.588	$\frac{7}{8}$	63.094	8.	169.856
$\frac{1}{4}$	.165	$\frac{5}{8}$	18.293	5.	66.35	$\frac{1}{4}$	180 696
$\frac{3}{8}$	.373	$\frac{3}{4}$	20.076	$\frac{1}{8}$	69.731	$\frac{1}{2}$	191.808
$\frac{1}{2}$	.663	$\frac{7}{8}$	21.944	$\frac{1}{4}$	73 172	$\frac{3}{4}$	203.26
$\frac{5}{8}$	1.043	3.	23 888	$\frac{3}{8}$	76.7	9.	215.04
$\frac{3}{4}$	1.493	$\frac{1}{8}$	25.926	$\frac{1}{2}$	80.304	$\frac{1}{4}$	227.152
$\frac{7}{8}$	2.032	$\frac{1}{4}$	28.04	$\frac{5}{8}$	84.001	$\frac{1}{2}$	239 6
1.	2.654	$\frac{3}{8}$	30.24	$\frac{3}{4}$	87.776	$\frac{3}{4}$	252.376
$\frac{1}{8}$	3.359	$\frac{1}{2}$	32.512	$\frac{7}{8}$	91.634	10.	265.4
$\frac{1}{4}$	4.147	$\frac{5}{8}$	34.886	6.	95.552	$\frac{1}{4}$	278.924
$\frac{3}{8}$	5.019	$\frac{3}{4}$	37.332	$\frac{1}{4}$	103.704	$\frac{1}{2}$	292.688
$\frac{1}{2}$	5.972	$\frac{7}{8}$	39.864	$\frac{3}{8}$	107.86	$\frac{3}{4}$	306.8
$\frac{5}{8}$	7.01	4.	42.464	$\frac{1}{2}$	112.16	11.	321.216
$\frac{3}{4}$	8.128	$\frac{1}{8}$	45.174	$\frac{5}{8}$	116.484	$\frac{1}{4}$	336.004
$\frac{7}{8}$	9.333	$\frac{1}{4}$	47.952	$\frac{3}{4}$	120.96	$\frac{1}{2}$	351.104
2.	10.616	$\frac{3}{8}$	50.815	7.	130.048	$\frac{3}{4}$	366.536
$\frac{1}{8}$	11.988	$\frac{1}{2}$	53.76	$\frac{1}{4}$	139.544	12.	382.208

WEIGHT OF FLAT ROLLED IRON.

FROM $\frac{1}{2} \times \frac{1}{8}$ INCH TO $5\frac{3}{4} \times 6$ INCHES.

One Foot in Length.

Thick.	Weight.	Thick.	Weight.	Thick.	Weight.	Thick.	Weight.	Thick.	Weight.
Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.
$\frac{1}{2}$		1. $\frac{3}{8}$		1. $\frac{3}{4}$		2. $\frac{1}{4}$		2. $\frac{1}{2}$	
$\frac{1}{8}$	.211	$\frac{1}{8}$	.58	1. $\frac{5}{8}$	9.61	$\frac{1}{8}$	.95	1. $\frac{5}{8}$	13.728
$\frac{1}{4}$	.422	$\frac{1}{4}$	1.161	1. $\frac{7}{8}$		$\frac{1}{4}$	1.9	1. $\frac{3}{4}$	14.784
$\frac{3}{8}$	.634	$\frac{3}{8}$	1.742	$\frac{1}{8}$	.792	$\frac{3}{8}$	2.851	1. $\frac{7}{8}$	15.84
$\frac{5}{8}$		$\frac{1}{2}$	2.325	$\frac{1}{4}$	1.584	$\frac{1}{2}$	3.802	2.	16.896
$\frac{1}{8}$	.264	$\frac{5}{8}$	2.904	$\frac{3}{8}$	2.376	$\frac{5}{8}$	4.752	2. $\frac{1}{8}$	17.952
$\frac{1}{4}$	.528	$\frac{3}{4}$	3.484	$\frac{1}{2}$	3.168	$\frac{3}{4}$	5.703	2. $\frac{1}{4}$	19.008
$\frac{3}{8}$	.792	$\frac{7}{8}$	4.065	$\frac{5}{8}$	3.96	$\frac{7}{8}$	6.653	2. $\frac{3}{8}$	20.064
$\frac{1}{2}$	1.056	1.	4.646	$\frac{3}{4}$	4.752	1.	7.604	2. $\frac{5}{8}$	
$\frac{3}{4}$		1. $\frac{1}{8}$	5.227	$\frac{7}{8}$	5.544	1. $\frac{1}{8}$	8.554	$\frac{1}{8}$	1.109
$\frac{1}{8}$	.316	1. $\frac{1}{4}$	5.808	1.	6.336	1. $\frac{1}{4}$	9.505	$\frac{1}{4}$	2.218
$\frac{1}{4}$	.633	1. $\frac{3}{8}$	6.389	1. $\frac{1}{8}$	7.129	1. $\frac{3}{8}$	10.455	$\frac{3}{8}$	3.327
$\frac{3}{8}$	.95	1. $\frac{1}{2}$		1. $\frac{1}{4}$	7.921	1. $\frac{1}{2}$	11.406	$\frac{1}{2}$	4.436
$\frac{1}{2}$	1.265	$\frac{1}{8}$	.633	1. $\frac{3}{8}$	8.713	1. $\frac{5}{8}$	12.356	$\frac{5}{8}$	5.545
$\frac{5}{8}$	1.584	$\frac{1}{4}$	1.266	1. $\frac{1}{2}$	9.505	1. $\frac{3}{4}$	13.307	$\frac{3}{4}$	6.654
$\frac{7}{8}$		$\frac{3}{8}$	1.9	1. $\frac{5}{8}$	10.297	1. $\frac{7}{8}$	14.257	$\frac{7}{8}$	7.763
$\frac{1}{8}$	.369	$\frac{1}{2}$	2.535	1. $\frac{3}{4}$	11.089	2.	15.208	1.	8.872
$\frac{1}{4}$	.738	$\frac{5}{8}$	3.168	2.		2. $\frac{1}{8}$	16.158	1. $\frac{1}{8}$	9.981
$\frac{3}{8}$	1.108	$\frac{3}{4}$	3.802	$\frac{1}{8}$	.845	2. $\frac{3}{8}$		1. $\frac{1}{4}$	11.09
$\frac{1}{2}$	1.477	$\frac{7}{8}$	4.435	$\frac{1}{4}$	1.689	$\frac{1}{8}$	1.003	1. $\frac{3}{8}$	12.199
$\frac{5}{8}$	1.846	1.	5.069	$\frac{3}{8}$	2.534	$\frac{1}{4}$	2.006	1. $\frac{1}{2}$	13.308
$\frac{3}{4}$	2.217	1. $\frac{1}{8}$	5.703	$\frac{1}{2}$	3.379	$\frac{3}{8}$	3.009	1. $\frac{5}{8}$	14.417
1.		1. $\frac{1}{4}$	6.337	$\frac{5}{8}$	4.224	$\frac{1}{2}$	4.013	1. $\frac{3}{4}$	15.526
$\frac{1}{8}$	.422	1. $\frac{3}{8}$	6.97	$\frac{3}{4}$	5.069	$\frac{5}{8}$	5.016	1. $\frac{7}{8}$	16.635
$\frac{1}{4}$	.845	1. $\frac{5}{8}$		$\frac{7}{8}$	5.914	$\frac{3}{4}$	6.019	2.	17.744
$\frac{3}{8}$	1.267	$\frac{1}{8}$	.686	1.	6.758	$\frac{7}{8}$	7.022	2. $\frac{1}{8}$	18.853
$\frac{1}{2}$	1.69	$\frac{1}{4}$	1.372	1. $\frac{1}{8}$	7.604	1.	8.025	2. $\frac{1}{4}$	19.962
$\frac{5}{8}$	2.112	$\frac{3}{8}$	2.059	1. $\frac{1}{4}$	8.448	1. $\frac{1}{8}$	9.028	2. $\frac{3}{8}$	21.071
$\frac{3}{4}$	2.534	$\frac{1}{2}$	2.746	1. $\frac{3}{8}$	9.294	1. $\frac{1}{4}$	10.032	2. $\frac{1}{2}$	22.18
$\frac{7}{8}$	2.956	$\frac{5}{8}$	3.432	1. $\frac{1}{2}$	10.138	1. $\frac{3}{8}$	11.035	2. $\frac{3}{4}$	
1. $\frac{1}{8}$		$\frac{3}{4}$	4.119	1. $\frac{5}{8}$	10.983	1. $\frac{1}{2}$	12.038	$\frac{1}{8}$	1.162
$\frac{1}{8}$	.475	$\frac{7}{8}$	4.805	1. $\frac{3}{4}$	11.828	1. $\frac{5}{8}$	13.042	$\frac{1}{4}$	2.323
$\frac{1}{4}$	.95	1.	5.492	1. $\frac{7}{8}$	12.673	1. $\frac{3}{4}$	14.045	$\frac{3}{8}$	3.485
$\frac{3}{8}$	1.425	1. $\frac{1}{8}$	6.178	2. $\frac{1}{8}$		1. $\frac{7}{8}$	15.048	$\frac{1}{2}$	4.647
$\frac{1}{2}$	1.901	1. $\frac{1}{4}$	6.864	$\frac{1}{8}$	.898	2.	16.051	$\frac{5}{8}$	5.808
$\frac{5}{8}$	2.375	1. $\frac{3}{8}$	7.551	$\frac{1}{4}$	1.795	2. $\frac{1}{8}$	17.054	$\frac{3}{4}$	6.97
$\frac{3}{4}$	2.85	1. $\frac{1}{2}$	8.237	$\frac{3}{8}$	2.693	2. $\frac{1}{4}$	18.057	$\frac{7}{8}$	8.132
$\frac{7}{8}$	3.326	1. $\frac{3}{4}$		$\frac{1}{2}$	3.591	2. $\frac{1}{2}$		1.	9.294
1.	3.802	$\frac{1}{8}$	.739	$\frac{5}{8}$	4.488	$\frac{1}{8}$	1.056	1. $\frac{1}{8}$	10.455
1. $\frac{1}{4}$		$\frac{1}{4}$	1.479	$\frac{3}{4}$	5.386	$\frac{1}{4}$	2.112	1. $\frac{1}{4}$	11.617
$\frac{1}{8}$	.528	$\frac{3}{8}$	2.218	$\frac{7}{8}$	6.283	$\frac{3}{8}$	3.168	1. $\frac{3}{8}$	12.779
$\frac{1}{4}$	1.056	$\frac{1}{2}$	2.957	1.	7.181	$\frac{1}{2}$	4.224	1. $\frac{1}{2}$	13.94
$\frac{3}{8}$	1.584	$\frac{5}{8}$	3.696	1. $\frac{1}{8}$	8.079	$\frac{5}{8}$	5.28	1. $\frac{5}{8}$	15.102
$\frac{1}{2}$	2.112	$\frac{3}{4}$	4.435	1. $\frac{1}{4}$	8.977	$\frac{3}{4}$	6.336	1. $\frac{3}{4}$	16.264
$\frac{5}{8}$	2.64	$\frac{7}{8}$	5.178	1. $\frac{3}{8}$	9.874	$\frac{7}{8}$	7.392	1. $\frac{7}{8}$	17.425
$\frac{3}{4}$	3.168	1.	5.914	1. $\frac{1}{2}$	10.772	1.	8.448	2.	18.587
$\frac{7}{8}$	3.696	1. $\frac{1}{8}$	6.653	1. $\frac{5}{8}$	11.67	1. $\frac{1}{8}$	9.504	2. $\frac{1}{8}$	19.749
1.	4.224	1. $\frac{1}{4}$	7.393	1. $\frac{3}{4}$	12.567	1. $\frac{1}{4}$	10.56	2. $\frac{1}{4}$	20.91
1. $\frac{1}{8}$	4.752	1. $\frac{3}{8}$	8.132	1. $\frac{7}{8}$	13.465	1. $\frac{3}{8}$	11.616	2. $\frac{3}{8}$	22.072
		1. $\frac{1}{2}$	8.871	2.	14.362	1. $\frac{1}{2}$	12.672	2. $\frac{1}{2}$	23.234
								2. $\frac{5}{8}$	24.395

WEIGHT OF FLAT ROLLED IRON—Continued.

Thick.	Weight.	Thick.	Weight.	Thick.	Weight.	Thick.	Weight.	Thick.	Weight.
Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.	Ins.	Lbs.
2.$\frac{7}{8}$		3.$\frac{1}{4}$		4.		4.$\frac{3}{4}$		5.$\frac{1}{2}$	
.$\frac{1}{8}$	1.215	1.$\frac{7}{8}$	20.594	1.	13.518	2.	32.105	1.	18.587
.$\frac{1}{4}$	2.429	2.	21.967	1.$\frac{1}{4}$	16.897	2.$\frac{1}{4}$	36.118	1.$\frac{1}{4}$	23.234
.$\frac{3}{8}$	3.644	2.$\frac{1}{4}$	24.712	1.$\frac{1}{2}$	20.277	2.$\frac{1}{2}$	40.131	1.$\frac{1}{2}$	27.881
.$\frac{1}{2}$	4.858	2.$\frac{1}{2}$	27.458	1.$\frac{3}{4}$	23.656	2.$\frac{3}{4}$	44.144	1.$\frac{3}{4}$	32.527
.$\frac{5}{8}$	6.072	2.$\frac{3}{4}$	30.204	2.	27.036	3.	48.157	2.	37.174
.$\frac{3}{4}$	7.287	3.	32.95	2.$\frac{1}{4}$	30.415	3.$\frac{1}{4}$	52.17	2.$\frac{1}{4}$	41.821
.$\frac{7}{8}$	8.502	3.$\frac{1}{2}$		2.$\frac{1}{2}$	33.795	3.$\frac{1}{2}$	56.184	2.$\frac{1}{2}$	46.468
1.	9.716	.$\frac{1}{8}$	1.479	2.$\frac{3}{4}$	37.174	3.$\frac{3}{4}$	60.197	2.$\frac{3}{4}$	51.114
1.$\frac{1}{8}$	10.931	.$\frac{1}{4}$	2.957	3.	40.554	4.	64.21	3.	55.761
1.$\frac{1}{4}$	12.145	.$\frac{3}{8}$	4.436	3.$\frac{1}{4}$	43.933	4.$\frac{1}{4}$	68.223	3.$\frac{1}{4}$	60.408
1.$\frac{3}{8}$	13.36	.$\frac{1}{2}$	5.914	3.$\frac{1}{2}$	47.313	4.$\frac{1}{2}$	72.235	3.$\frac{1}{2}$	65.055
1.$\frac{1}{2}$	14.574	.$\frac{5}{8}$	7.393	3.$\frac{3}{4}$	50.692	5.		3.$\frac{3}{4}$	69.701
1.$\frac{5}{8}$	15.789	.$\frac{3}{4}$	8.871	4.$\frac{1}{4}$		.$\frac{1}{4}$	4.224	4.	74.348
1.$\frac{3}{4}$	17.003	.$\frac{7}{8}$	10.35	.$\frac{1}{8}$	1.795	.$\frac{1}{2}$	8.449	4.$\frac{1}{4}$	78.995
1.$\frac{7}{8}$	18.218	1.	11.828	.$\frac{1}{4}$	3.591	.$\frac{3}{4}$	12.673	4.$\frac{1}{2}$	83.642
2.	19.432	1.$\frac{1}{8}$	13.307	.$\frac{1}{2}$	7.181	1.	16.897	4.$\frac{3}{4}$	88.288
2.$\frac{1}{8}$	20.647	1.$\frac{1}{4}$	14.785	.$\frac{3}{4}$	10.772	1.$\frac{1}{4}$	21.122	5.	92.935
2.$\frac{1}{4}$	21.861	1.$\frac{3}{8}$	16.264	1.	14.364	1.$\frac{1}{2}$	25.346	5.$\frac{1}{4}$	97.582
2.$\frac{3}{8}$	23.076	1.$\frac{1}{2}$	17.742	1.$\frac{1}{4}$	17.953	1.$\frac{3}{4}$	29.57	5.$\frac{3}{4}$	
2.$\frac{1}{2}$	24.29	1.$\frac{5}{8}$	19.221	1.$\frac{1}{2}$	21.544	2.	33.795	.$\frac{1}{2}$	9.716
2.$\frac{5}{8}$	25.505	1.$\frac{3}{4}$	20.699	1.$\frac{3}{4}$	25.135	2.$\frac{1}{4}$	38.019	.$\frac{3}{4}$	14.574
2.$\frac{3}{4}$	26.719	1.$\frac{7}{8}$	22.178	2.	28.725	2.$\frac{1}{2}$	42.243	1.	19.432
3.		2.	23.656	2.$\frac{1}{4}$	32.316	2.$\frac{3}{4}$	46.468	1.$\frac{1}{4}$	24.29
.$\frac{1}{8}$	1.267	2.$\frac{1}{4}$	26.613	2.$\frac{1}{2}$	35.907	3.	50.692	1.$\frac{1}{2}$	29.148
.$\frac{1}{4}$	2.535	2.$\frac{1}{2}$	29.57	2.$\frac{3}{4}$	39.497	3.$\frac{1}{4}$	54.916	1.$\frac{3}{4}$	34.006
.$\frac{3}{8}$	3.802	2.$\frac{3}{4}$	32.527	3.	43.088	3.$\frac{1}{2}$	59.14	2.	38.864
.$\frac{1}{2}$	5.069	3.	35.485	3.$\frac{1}{4}$	46.679	3.$\frac{3}{4}$	63.365	2.$\frac{1}{4}$	43.722
.$\frac{5}{8}$	6.337	3.$\frac{1}{4}$	38.441	3.$\frac{1}{2}$	50.269	4.	67.589	2.$\frac{1}{2}$	48.58
.$\frac{3}{4}$	7.604	3.$\frac{3}{4}$		3.$\frac{3}{4}$	53.86	4.$\frac{1}{4}$	71.813	2.$\frac{3}{4}$	53.437
.$\frac{7}{8}$	8.871	.$\frac{1}{8}$	1.584	4.	57.45	4.$\frac{1}{2}$	76.038	3.	58.296
1.	10.138	.$\frac{1}{4}$	3.168	4.$\frac{1}{2}$		4.$\frac{3}{4}$	80.262	3.$\frac{1}{4}$	63.154
1.$\frac{1}{8}$	11.406	.$\frac{3}{8}$	4.752	.$\frac{1}{4}$	3.802	5.$\frac{1}{4}$		3.$\frac{1}{2}$	68.012
1.$\frac{1}{4}$	12.673	.$\frac{1}{2}$	6.336	.$\frac{1}{2}$	7.604	.$\frac{1}{4}$	4.436	3.$\frac{3}{4}$	72.87
1.$\frac{3}{8}$	13.94	.$\frac{5}{8}$	7.921	.$\frac{3}{4}$	11.406	.$\frac{1}{2}$	8.871	4.	77.728
1.$\frac{1}{2}$	15.208	.$\frac{3}{4}$	9.505	1.	15.208	.$\frac{3}{4}$	13.307	4.$\frac{1}{4}$	82.585
1.$\frac{5}{8}$	16.475	.$\frac{7}{8}$	11.089	1.$\frac{1}{4}$	19.01	1.	17.742	4.$\frac{1}{2}$	87.443
1.$\frac{3}{4}$	17.742	1.	12.673	1.$\frac{1}{2}$	22.812	1.$\frac{1}{4}$	22.178	4.$\frac{3}{4}$	92.301
1.$\frac{7}{8}$	19.01	1.$\frac{1}{8}$	14.257	1.$\frac{3}{4}$	26.614	1.$\frac{1}{2}$	26.613	5.	97.159
2.	20.277	1.$\frac{1}{4}$	15.841	2.	30.415	1.$\frac{3}{4}$	31.049	5.$\frac{1}{4}$	102.017
2.$\frac{1}{4}$	22.811	1.$\frac{3}{8}$	17.425	2.$\frac{1}{4}$	34.217	2.	35.484	5.$\frac{1}{2}$	106.876
2.$\frac{1}{2}$	25.346	1.$\frac{1}{2}$	19.009	2.$\frac{1}{2}$	38.019	2.$\frac{1}{4}$	39.92	6.	116.592
2.$\frac{3}{4}$	27.881	1.$\frac{5}{8}$	20.594	2.$\frac{3}{4}$	41.82	2.$\frac{1}{2}$	44.355		
3.$\frac{1}{4}$		1.$\frac{3}{4}$	22.178	3.	45.623	2.$\frac{3}{4}$	48.791		
.$\frac{1}{8}$	1.373	1.$\frac{7}{8}$	23.762	3.$\frac{1}{4}$	49.425	3.	53.226		
.$\frac{1}{4}$	2.746	2.	25.346	3.$\frac{1}{2}$	53.226	3.$\frac{1}{4}$	57.662		
.$\frac{3}{8}$	4.119	2.$\frac{1}{4}$	28.514	3.$\frac{3}{4}$	57.028	3.$\frac{1}{2}$	62.097		
.$\frac{1}{2}$	5.492	2.$\frac{1}{2}$	31.682	4.	60.83	3.$\frac{3}{4}$	66.533		
.$\frac{5}{8}$	6.865	2.$\frac{3}{4}$	34.851	4.$\frac{1}{4}$	64.632	4.	70.968		
.$\frac{3}{4}$	8.237	3.	38.019	4.$\frac{3}{4}$		4.$\frac{1}{4}$	75.404		
.$\frac{7}{8}$	9.61	3.$\frac{1}{4}$	41.187	.$\frac{1}{4}$	4.013	4.$\frac{1}{2}$	79.839		
1.	10.983	3.$\frac{1}{2}$	44.355	.$\frac{1}{2}$	8.026	4.$\frac{3}{4}$	84.275		
1.$\frac{1}{8}$	12.356	4.		.$\frac{3}{4}$	12.036	5.	88.71		
1.$\frac{1}{4}$	13.73	.$\frac{1}{8}$	1.69	1.	16.052	5.$\frac{1}{2}$			
1.$\frac{3}{8}$	15.102	.$\frac{1}{4}$	3.38	1.$\frac{1}{4}$	20.066	.$\frac{1}{4}$	4.647		
1.$\frac{1}{2}$	16.475	.$\frac{1}{2}$	6.759	1.$\frac{1}{2}$	24.079	.$\frac{1}{2}$	9.294		
1.$\frac{5}{8}$	17.848	.$\frac{3}{4}$	10.138	1.$\frac{3}{4}$	28.092	.$\frac{3}{4}$	13.94		
1.$\frac{3}{4}$	19.221								

WEIGHTS OF WROUGHT IRON, STEEL, COPPER AND BRASS PLATES.

Thickness determined by Birmingham Gauge.

No. of Gauge.	Thickness of each Number.	PLATES—PER SQUARE FOOT.			
		Iron.	Steel.	Copper.	Brass.
	Ins.	Lbs.	Lbs.	Lbs.	Lbs.
cooo	.454	18.2167	18.4596	20.5662	19.4312
ooo	.425	17.0531	17.2805	19.2525	18.19
oo	.38	15.2475	15.4508	17.214	16.264
o	.34	13.6425	13.8244	15.402	14.552
1	.3	12.0375	12.198	13.59	12.84
2	.284	11.3955	11.5474	12.8652	12.1552
3	.259	10.3924	10.5309	11.7327	11.0852
4	.238	9.5497	9.6771	10.7814	10.1864
5	.22	8.8275	8.9452	9.966	9.416
6	.203	8.1454	8.254	9.1959	8.6884
7	.18	7.2225	7.3188	8.154	7.704
8	.165	6.6206	6.7089	7.4745	7.062
9	.148	5.9385	6.0177	6.7044	6.3344
10	.134	5.3767	5.4484	6.0702	5.7352
11	.12	4.815	4.8792	5.436	5.136
12	.109	4.3736	4.4319	4.9377	4.6652
13	.095	3.8119	3 8627	4.3035	4.066
14	.083	3 3304	3.3748	3.7599	3.5524
15	.072	2.889	2.9275	3.2616	3.0816
16	.065	2.6081	2.6429	2.9445	2.782
17	.058	2.3272	2.3583	2.6274	2.4824
18	.049	1.9661	1.9923	2.2197	2.0972
19	.042	1.6852	1.7077	1.9026	1.7976
20	.035	1.4044	1.4231	1.5855	1.498
21	.032	1.284	1.3011	1.4496	1.3696
22	.028	1.1235	1.1385	1.2684	1.1984
23	.025	1.0031	1.0165	1.1325	1.07
24	.022	.8827	.8945	.9966	.9416
25	.02	.8025	.8132	.906	.856
26	.018	.7222	.7319	.8154	.7704
27	.016	.642	.6506	.7248	.6848
28	.014	.5617	.5692	.6342	.5992
29	.013	.5216	.5286	5889	.5564
30	.012	.4815	.4879	5436	.5136
31	.01	.4012	.4066	453	.428
32	.009	.3611	.3659	.4077	.3852
33	.008	.321	.3253	.3624	.3424
34	.007	.2809	.2846	.3171	.2996
35	.005	.2006	.2033	.2265	.214
36	.004	.1605	.1626	.1812	.1712

WEIGHT OF WIRE PER LINEAL FOOT.

Diameter determined by Birmingham Gauge.

No. of Gauge.	Diameter of each Number.	WIRE—PER LINEAL FOOT.			
		Wrought Iron.	Steel.	Copper.	Brass.
	Ins.	Lbs.	Lbs.	Lbs.	Lbs.
0000	.454	.546207	.55136	.623913	.589286
000	.425	.478656	.483172	.546752	.516407
00	.38	.38266	.38627	.437099	.41284
0	.34	.30634	.30923	.349921	.3305
1	.3	.2385	.24075	.27243	.25731
2	.284	.213738	.215755	.244146	.230596
3	.259	.177765	.179442	.203054	.191785
4	.238	.150107	151523	.171461	.161945
5	.22	.12826	12947	.146507	.138376
6	.203	.109204	.110234	.12474	.117817
7	.18	.08586	.086667	.098075	.092632
8	.165	.072146	.072827	.08241	.077836
9	.148	.058046	.058593	.066303	.062624
10	.134	.047583	.048032	.054353	.051356
11	.12	.03816	.03852	.043589	.04117
12	.109	.031485	.031782	.035964	.033968
13	.095	.023916	.024142	.027319	.025802
14	.083	.018256	.018428	.020853	.019696
15	.072	.013738	.013867	.015692	.014821
16	.065	.011196	.011302	.012789	.012079
17	.058	.008915	.008999	.010183	.009618
18	.049	.006363	.006423	.007268	.006864
19	.042	.004675	.004719	.00534	.005043
20	.035	.003246	.003277	.003708	.003502
21	.032	.002714	.002739	.0031	.002928
22	.028	.002078	.002097	.002373	.002241
23	.025	.001656	.001672	.001892	.001787
24	.022	.001283	.001295	.001465	.001384
25	.02	.00106	.001070	.001211	.001144
26	.018	.0008586	.0008667	.0009807	.0009263
27	.016	.0006784	.0006848	.0007749	.0007319
28	.014	.0005194	.0005243	.0005933	.0005604
29	.013	.0004479	.0004521	.0005116	.0004832
30	.012	.0003816	.0003852	.0004359	.0004117
31	.01	.000265	.0002675	.0003027	.0002859
32	.009	.0002147	.0002167	.0002452	.0002316
33	.008	.0001696	.0001712	.0001937	.000183
34	.007	.0001299	.0001311	.0001483	.0001401
35	.005	.00006625	.00006688	.00007568	.00007148
36	.004	.0000424	.0000428	.00004843	.00004574

WEIGHT OF WROUGHT ANGLE IRON.

FROM 1¼ TO 4½ INCHES.

One Foot in Length.

THICKNESS MEASURED IN THE MIDDLE OF EACH SIDE.

L EQUAL SIDES.			L UNEQUAL SIDES.		
Sides.	Thickness.	Weight.	Sides.	Thickness.	Weight.
Ins.	Ins.	Lbs.	Ins.	Ins.	Lbs.
1.25 × 1.25	$\cdot\frac{3}{16}$	1.5	3. × 2.5	$\cdot\frac{3}{8}$	6.25
1.5 × 1.5	$\cdot\frac{3}{16}$	2.	3.5 × 3.	$\cdot\frac{7}{16}$	7.75
1.75 × 1.75	$\cdot\frac{1}{4}$	3.	3.5 × 3.	$\cdot\frac{7}{16}$	9.6
2. × 2.	$\cdot\frac{1}{4}$	3.5	4. × 3.	$\cdot\frac{1}{2}$	11.
2.25 × 2.25	$\cdot\frac{5}{16}$	4.5	4. × 3.5	$\cdot\frac{1}{2}$	11.5
2.5 × 2.5	$\cdot\frac{5}{16}$	5.	4. × 3.5	$\cdot\frac{1}{2}$	11.75
3. × 3.	$\cdot\frac{3}{8}$	7.	4.5 × 3.	$\cdot\frac{1}{2}$	11.75
3.5 × 3.5	$\cdot\frac{7}{16}$	9.	5. × 3.	$\cdot\frac{1}{2}$	12.65
4. × 4.	$\cdot\frac{1}{2}$	12.5	5. × 3.	$\cdot\frac{9}{16}$	13.7
4.5 × 4.5	$\cdot\frac{1}{2}$	14.	5.5 × 3.5	$\cdot\frac{1}{2}$	14.5
4.5 × 4.5	$\cdot\frac{9}{16}$	16.	5.5 × 3.5	$\cdot\frac{9}{16}$	15.6
			6. × 3.5	$\cdot\frac{5}{8}$	18.
			6. × 4.5	$\cdot\frac{5}{8}$	20.
			T 2. × 2.375*	$\cdot\frac{3}{8}$	5.5
			2.5 × 2.875	$\cdot\frac{3}{8}$	6.5
			3.5 × 3.5	$\cdot\frac{7}{16}$	10.5
			4. × $\frac{7}{16}$ } × 3.5 × $\frac{3}{4}$ }		13.
			4. × 3.5	$\cdot\frac{3}{4}$	13.5

* This column gives the depth of the web added to the thickness of the base or flange.

WEIGHT OF A SQUARE FOOT OF CAST AND WROUGHT IRON, COPPER, LEAD, BRASS AND ZINC.

FROM $\frac{1}{16}$ TO 1 INCH IN THICKNESS.

Thick.	Cast Iron.	Wro't Iron.	Copper.	Lead.	Brass.	Zinc.
Inch.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
$\cdot\frac{1}{16}$	2.346	2.517	2.89	3.691	2.675	2.34
$\cdot\frac{1}{8}$	4.693	5.035	5.781	7.382	5.35	4.68
$\cdot\frac{3}{16}$	7.039	5.552	8.672	11.074	8.025	7.02
$\cdot\frac{1}{4}$	9.386	10.07	11.562	14.765	10.7	9.36
$\cdot\frac{5}{16}$	11.733	12.588	14.453	18.456	13.375	11.7
$\cdot\frac{3}{8}$	14.079	15.106	17.344	22.148	16.05	14.04
$\cdot\frac{7}{16}$	16.426	17.623	20.234	25.839	18.725	16.34
$\cdot\frac{1}{2}$	18.773	20.141	23.125	29.53	21.4	18.72
$\cdot\frac{9}{16}$	21.119	22.659	26.016	33.222	24.075	
$\cdot\frac{5}{8}$	23.466	25.176	28.906	36.913	26.75	
$\cdot\frac{11}{16}$	25.812	27.694	31.797	40.604	29.425	
$\cdot\frac{3}{4}$	28.159	30.211	34.688	44.296	32.1	
$\cdot\frac{13}{16}$	30.505	32.729	37.578	47.987		
$\cdot\frac{7}{8}$	32.852	35.247	40.469	51.678		
$\cdot\frac{15}{16}$	35.199	37.764	43.359	55.37		
1.	37.545	40.282	46.25	59.061		

NOTE.—The Wrought Iron is that of hard rolled Pennsylvania plates, and the Copper that of hard rolled plates from the Works of Messrs. Phelps, Dodge & Co., Conn.

MARKS AND WEIGHTS OF ENGLISH TIN PLATES.

Brand.	Plates per Box.	Length and Breadth.	Net Weight per Box.
	No.	Ins.	Lbs.
1 C or 1 Com.	225	$13\frac{3}{4} \times 10$	112
2 C	225	$13\frac{1}{4} \times 9\frac{3}{4}$	105
3 C	225	$12\frac{3}{4} \times 9\frac{1}{2}$	98
H C	225	$13\frac{3}{4} \times 10$	119
H X	225	$13\frac{3}{4} \times 10$	157
1 X	225	$13\frac{3}{4} \times 10$	140
2 X	225	$13\frac{1}{4} \times 9\frac{3}{4}$	133
3 X	225	$12\frac{3}{4} \times 9\frac{1}{2}$	126
1 XX	225	$13\frac{3}{4} \times 10$	161
1 XXX	225	$13\frac{3}{4} \times 10$	182
1 XXXX	225	$13\frac{3}{4} \times 10$	203
1 XXXXX	225	$13\frac{3}{4} \times 10$	224
1 XXXXXX	225	$13\frac{3}{4} \times 10$	245
DC	100	$16\frac{3}{4} \times 12\frac{1}{2}$	98
DX	100	$16\frac{3}{4} \times 12\frac{1}{2}$	126
DXX	100	$16\frac{3}{4} \times 12\frac{1}{2}$	147
DXXX	100	$16\frac{3}{4} \times 12\frac{1}{2}$	168
DXXXX	100	$16\frac{3}{4} \times 12\frac{1}{2}$	189
SDC	200	15 × 11	168
SDX	200	15 × 11	188
SDXX	200	15 × 11	209
SDXXX	200	15 × 11	230
SDXXXX	200	15 × 11	251
SDXXXXX	200	15 × 11	272
SDXXXXXX	200	15 × 11	293
Leaded IC	112	20 × 14	112
do. IX	112	20 × 14	140
ICW	225	$13\frac{3}{4} \times 10$	112
IXW	225	$13\frac{3}{4} \times 10$	140
CSDW	200	15 × 11	168
CIIW	100	$16\frac{3}{4} \times 12\frac{1}{2}$	105
XIIW	100	$16\frac{3}{4} \times 12\frac{1}{2}$	126
TT	450	$13\frac{3}{4} \times 10$	112
XTT	450	$13\frac{3}{4} \times 10$	126

When the plates are 14 × 20 inches, there are 112 in a box.

TABLES OF

MONEY, WEIGHT AND MEASURE,

OF THE

PRINCIPAL COMMERCIAL COUNTRIES IN THE WORLD,

The value of the Money in each given in the United States Federal Currency, as also usually in English Sterling Currency; and of the Weights and Measures in the American (or English) weights and measures.

[*From* ELIHU BURRITT'S *Year-Book of the Nations.*]

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a, signifies of, or containing.

UNITED STATES.

MONEY.

The national currency of the United States is termed the Federal Currency, and is the most convenient of that of any nation on the globe, its different denominations proceeding in a decimal proportion.

10 mills	=	1 cent, c.
10 cents	=	1 dime, d.
10 dimes	=	1 dollar, $
10 dollars	=	1 eagle, e.

WEIGHT.

Avoirdupois Weight.

16 drams	=	1 ounce, oz.
16 oz.	=	1 pound, lb.
28 lbs.	=	1 quarter, qr.
4 qrs.	=	1 hundred, cwt.
20 cwt.	=	1 ton
175 troy pounds	=	144 pounds, avoir.
1 pound troy	=	5760 grains
1 lb. avoir.	=	7000 grains

Troy Weight.

24 grains, gr.	=	1 pennyweight, dwt.
20 dwt.	=	1 ounce, oz.
12 oz.	=	1 pound, lb.

Gold, silver and jewels are weighed by this weight.

Apothecaries' Weight.

20 grains	=	1 scruple, ℈
3 ℈	=	1 dram, ʒ
8 ʒ	=	1 ounce, ℥
12 ℥	=	1 pound, lb.

This weight is used by apothecaries and physicians in *compounding* medicines; but drugs and medicines are bought and sold by *avoirdupois* weight. The *pound* and *ounce* in this weight are the same as the *troy* pound and ounce.

MEASURE.

Long Measure.

3 barleycorns	=	1 inch
12 inches	=	1 foot
3 feet	=	1 yard
5½ yards	=	1 rod, perch or pole
40 rods or perches	=	1 furlong
8 furlongs	=	1 mile
6 feet	=	1 fathom
4 inches	=	1 hand
3 miles	=	1 league
60 naut. or geog. miles	=	1 degree
69⅛ statute miles	=	1 degree, nearly
9 inches	=	1 span
18 inches	=	1 cubit

Long Measure is used in measuring distances, where length only is considered.

m. or l., more or less.

Square Measure.

144 sq. inches	=	1 sq. foot
9 sq. feet	=	1 sq. yard
30¼ sq. yards or 272¼ sq. feet	=	1 sq. rod, perch or pole
40 sq. rods	=	1 rood
4 roods or 160 sq. rods	=	1 acre
640 acres	=	1 sq. mile

Square Measure is used in measuring surfaces, as land, flooring, plastering, &c.

Cubic Measure.

1728 cu. inches	=	1 cu. foot
27 cu. feet	=	1 cu. yard
40 feet of round or 50 feet of hewn timber	=	1 ton, or load
42 cubic feet	=	1 ton of shipping
16 cu. feet	=	1 foot of wood, or a cord foot
8 cord feet, or 128 cubic feet	=	1 cord

Cubic Measure is used in measuring solid bodies having *length*, *breadth* and *thickness*; as timber, stone, boxes of goods, the capacity of rooms, ships, &c.

Cloth Measure.

2¼ inches	=	1 nail.
4 nails	=	1 quarter.
4 quarters	=	1 yard.
3 quarters	=	1 ell Flemish.
5 quarters	=	1 ell English.
6 quarters	=	1 ell French.

Is used in buying and selling cloth, ribbons, &c.

Wine Measure.

4 gills	=	1 pint.
2 pints	=	1 quart.
4 quarts	=	1 gallon.
42 gallons	=	1 tierce.
1½ tierce, or 63 gal.	=	1 hogshead.
1⅓ hogshead or 84 gal.	=	1 puncheon.
1⅓ puncheon, or 126 gal.	=	1 pipe.
2 pipes	=	1 tun.
231 cubic inches	=	1 gallon.
10 gallons	=	1 anker.
18 gallons	=	1 runlet.
31½ gallons	=	1 barrel.

Wine, spirits, cider, vinegar, oil, honey, etc., are measured and sold by this measure.

Dry Measure.

2 pints	=	1 quart, qt.
4 quarts	=	1 gallon, gal.
2 gallons	=	1 peck, pk.
4 pecks	=	1 bushel, bu.
36 bushels	=	1 chaldron, ch.
4 bushels in England	=	1 coom.
2 cooms	=	1 quarter.
5 quarters	=	1 wey.
2 weys	=	1 last.

A gallon, dry measure, contains 268 4-5 Cu. in. This measure applies to all goods that are not liquid and are sold by measure, as corn, fruit, salt, coal, etc.

Measuring Distances.

7 92-100 inches	=	1 link.
25 links	=	1 pole.
100 links	=	1 chain.
10 chains	=	1 furlong.
8 furlongs	=	1 mile.

Used by engineers, surveyors, etc.

Time.

60 seconds	=	1 minute.
60 minutes	=	1 hour.
24 hours	=	1 day.
7 days	=	1 week.
4 weeks	=	1 months.
13 months, 1 day, 6 hours or 365 days, 6 hours	=	1 Julian year.
12 calendar months	=	1 year.

Used for computing time.

Circular Motion.

60 seconds	=	1 prime minute.
60 minutes	=	1 degree, °.
30 degrees	=	1 sign, s.
12 signs or 360 degrees	=	The whole great circle of the zodiac.

Used in measuring latitude and longitude, etc.

GREAT BRITAIN.

(PRINCIPAL COMMERCIAL CITY, LONDON.)

Money.

By the usages of bankers for ages, the pound sterling has been valued by the old Spanish Carolus pillar dollar, now entirely out of circulation in Europe and America; of these, $4.44 4-9 were equivalent to the pound sterling.

This rate originally represented the true par of exchange between the two countries. In 1834 the eagle was reduced in weight to 258 grains (see Tables of Coins of U. S.), and now contains 232-2 grains pure gold.

The English sovereign is the coined piece of which the pound sterling is the money of account, and contains 113.001 grains pure gold.

Standard weight of sovereign, grains	123,274
Alloy, 1-12th part - - - -	10,273
Fine gold in the sovereign - -	113,001

By the proportion—

232.2 grains : 113,001 grains :: $10,

we find that the eqivalent of the pound sterling is $4.8665; and allowing for the wear of coin, we have $4.84, the value established by Congress in 1842, and the rate at which duties are estimated in the Custom-Houses.

It has been found convenient to retain the *old* value as the basis of exchange, and to express the present exchangeable value by a *premium* on this basis. It requires the addition of 9 per cent. to make the Custom-house value, and the addition of about 9½ per cent. to equal the intrinsic value, of a pound sterling in our currency.

Old par value of £1 - -	$4.444
9 per cent. premium - - -	.399
Custom-House value, - -	$4.843
Old par value. - - -	$4.4444
9½ per cent. premium, - -	.4222
Intrinsic value, - -	$4.8666

Exchange quotations refer to the old par. When, therefore, exchange is quoted at about 9½ per cent. premium there is fact no real premium, but the true par has been attained. When nothing is said to the contrary, the quotations are for bills at *usance*, or 60 days' sight and 3 days of grace, which, at 6 per cent. interest, involves a loss of more than 1 per cent. besides the time of transportation. On the other hand, 1 per cent. is about the cost, including freight, insurance, etc., of shipping gold; and as one of these items balances the other, the real par of exchange on England is 9½ per cent., at which rate it is as well, or better, to remit good 60-day bills as specie.

4 farthings, qr.	=	1 penny, d.
12 pence,	=	1 shilling, s.
20 shillings	=	1 pound, £.
A sovereign	=	20 shillings.
A guinea	=	21 "
A crown	=	5 "
A groat	=	4 pence.

The farthing is an imaginary coin; the penny, copper; the sixpence, shilling and crown, silver; sovereign and guinea, gold.

The English Tables of Weights, Measures, Time, etc., are the same essentially as the American.

The value of the Pound Sterling in the following Tables is put at $4.84.

AUSTRIA.

(*Chief Commercial City*, VIENNA.)

MONEY, in Silver.

fl. krt.		£	s.	d.		$	c.	m.
10 0	=	1	0	0	=	4	84	0
0 30	=	0	1	0	=	0	24	2
0 2½	=	0	0	1	=	0	02	0 2-12
7 0	=	0	13	6	=	3	26	7
4 40 or ducat	=	0	9	4	=	2	25	8 8-12
1 0 silver florin	=	0	2	0	=	0	48	4
2 0 or 1 dollar	=	0	4	0	=	0	96	8
0 20 or 1 zwanziger	=	0	0	8	=	0	16	1 4-12

1 florin is equal to 60 kreutzers.

WEIGHTS AND MEASURES.

AUSTRIAN.		ENGLISH.
100 commercial lbs.	=	123.6 lbs. avoirdp.
1 staro	=	2.34 Winch. bush.
1 polonick	=	0.861 ditto.
1 eimer	=	15 wine gallons
1 barile	=	173½ ditto
1 ell woolen measure	=	25.6 in.
1 ell silk "	=	25.2 in.

Or more particularly—

WEIGHT.

AUSTRIAN.		ENGLISH.
100 commercial lbs.	=	123.6 lbs. avoirdp.
1 lb.	=	4 vindlinge
1 vindlinge	=	4 unzen
1 unzen	=	2 loth
1 loth	=	4 quintl.
1 stone	=	20 lbs.
1 sanne	=	275 lbs.

MEASURE.

1 foot	=	12½ inches
1 nult	=	4⅝ miles

GRAIN.

64 moasel	=	1 metz
30 metz	=	1 muth
1 muth	=	50⅝ bush. Eng.

BAVARIA AND BADEN.

(*Principal Commercial City* AUGSBURG.)

MONEY.

fl. krt.		£	s.	d.		$	c.	m.
12 0 at par	=	1	0	0	=	4	84	0
0 36	=	0	1	0	=	0	24	2
0 3	=	0	0	1	=	0	02	0 2-12
10 0 gold 10 guildr. piece	=	0	16	8	=	4	03	3 4-12
5 0 gold 5 do. do.	=	0	8	4	=	2	01	6 8-12
3 30 silver 3½ flor. piece	=	0	5	10	=	1	41	1 8-12
5 35 or ducat	=	0	9	3	=	2	23	8 6-12
2 42 or crown thaler	=	0	4	4	=	1	04	8 8-12
1 0	=	0	1	8	=	0	40	3 4-12

1 florin is equal to 60 kreutzers.

Books are kept in Gulden, a 60 kreutzer of the 20 gulden fuss, so called because the Cologne mark of fine silver is worth only 60 fl. Augsburg currency, while all other South German States reckon on the 24 golden fuss.

COIN.—Gold (old). 1 Caroline=18s. 6d. English =$4 44.
½ Caroline = 9s. 3d. English=$2.22
1 double max d'or=24s. 4d. English=$5 84.
1 max d'or=12s. 2d. English=2.92.
1 ducat (new)=9s. 4d. English=$2 24.
Silver pieces of 3½ gulden, 1 gulden, ½ gulden, 1 kreutzer, 3 kreutzer, all in the 24 golden fuss.

WEIGHT.

1 pound=560 grammes French=1¼ pound avoirdupois.
1 cwt.=100 pounds=3,200 loth=12,800 quent.
1 Augsburg mare=16 loth=64 quent=256 pfenning=3,643 grains troy English.

MEASURE.

The foot=11½ inches English.
1 ruthe=10 feet=120 zoll or inches=1440 lines.
1 ell=2 41-48 feet=33¾ inches English.
1 klafter=6 feet=5¾ feet English.

FOR CORN.—1 scheffel=6 bushels 1 gallon English.
1 scheffel=6 metz=12 viertel=48 maas.

FOR LIQUORS.—Wine, 1 eymer=60 maas.
Beer, 1 " =60 "
1 maas=1 7-8 pints English.

BELGIUM.

(*Principal Commercial City* ANTWERP.)

MONEY (at par.)

fr.	cts.	£	s.	d.	$	c.	m.
25	0	= 1	0	0	= 4	84	0
1	25	= 0	1	0	= 0	24	2
0	10	= 0	0	1	= 0	02	0 2-12
25	0 or 1 gold Leopold	= 0	19	10	= 4	79	9 8-12
10	0 or 10 franc piece	= 0	7	10	= 1	89	5 8-13
5	0 or 5 franc piece	= 0	3	11	= 0	94	7 10-12
1	0	= 0	0	9½	= 0	19	1 7-12

1 franc is equal to 100 centimes.
Weights and measures the same as in France.

BRAZILS.

(*Principal Commercial City*, RIO DE JANEIRO.)

MONEY.

reis.	£	s.	d.	$	c.	m.
6400 or gold piece =	1	15	9	= 8	65	1 6-12
4000 or gold piece of =	1	0	0	= 4	84	0
1200 or silver piece of =	0	4	2	= 1	00	8 4-12
960 " =	0	4	1	= 0	98	0 4-12
640 " =	0	2	9	= 0	66	5 6-12
320 " =	0	1	4	= 0	32	2 8-12
200 " =	0	0	8	= 0	16	1 4-12

1 mil reis is equal to 1000 reis.

The unit is the reis as in Portugal.
COIN.—Gold dobra a 12,800 reis=$18.
Meia dobra a 6.400 reis=$9.
Moeda a 4000 reis=$5 75
Silver.—Pieces of 1200 reis=$1; 400 reis=$0.33.
Pieces of 100 reis=$0.08.
Bank notes are worth less than specie by about one-third.
Exchange on London, 30d. sterling per milrea in bank notes.
Exchange on Paris. fr. 3.15 to 3.20 per 1000 reis.

WEIGHT.

1 quintal=4 arrobas a 32 arratels, (pounds).
1 arratel (lb)=11½ oz. avdp.
1 quintal=91⅙ lb. avdp.
Gold and silver weight is the arratal a 2.
Marcos a 8 oncas a 8 oitavas a 72 granos.
1 marco=7 oz. 7 4-7 dwts. troy.

Diamonds, emeralds, rubies, pearls etc. are sold by the quilate. Topazes, by the oitava a 3 escrupulos a 3 quilates a 4 granos.
1 oitava=1 oz. 19 9-10 dwts. troy.
1 quilate=4 13-30 dwts. troy.

MEASURE.

1 pe (foot)=1 foot English.
1 palmo=9 ½ inches Eng.
1 braca=2 varas=3 ⅓ covados=10 palmas.
1 braca=2⅔ yards Eng.
1 legoa (mile)=4¾ miles Eng.
CORN, RICE, COFFEE, &c.—1 mayo=15 fanegas, each fanega=4 alqueires.
1 mayo=22 ½ bushels Eng.
1 fanega=1 1¾ gallons.
WINE.—The same as in Portugal.

BREMEN.

(*One of the Four Free Cities of Germany.*)

MONEY.

rigdl.	grosch.	£	s.	d.	$	c.	m.
6	6 =	1	0	0	= 4	84	0
0	24 =	0	1	0	= 0	24	2
1	0 or gold rigxdal =	0	3	4	= 0	80	6 8-12
0	36 or 36 groat piece =	0	1	6	= 0	36	3
5	24 or Louis-d'or =	0	16	0	= 3	87	2

1 thaler is equal to 72 groten.

BRUNSWICK & HANOVER.

(*Principal Commercial Cities*, BRUNSWICK *and* HANOVER.)

MONEY.

tl.	grs.	pfn.	£	s.	d.	$	c.	m.
6	16	0 =	1	0	0	= 4	84	0
0	8	0 =	0	1	0	= 0	24	2
0	0	10 =	0	0	1	= 0	02	0 2-12
10	0	0 dble. George-d'or =	1	12	4	= 7	72	4 8-12
5	0	0 or single " =	0	16	2	= 3	91	3 4-12
1	0	0 =	0	3	0	=		
0	1	0 or 12 pfennings =	0	0	1¼	= 0	02	5 5-24

1 thaler is equal to 24 groschen.

CHINA.

(*Principal Commercial City*, CANTON.)

MONEY.

The Chinese reckon in tacls, a 10 mace, a 10 candarin, a 10 cash.
1 tael=6s. 6d.=$1.56.
COIN.—They only have the cash or li. All other are imaginary. They use the piasters of Spain at 72 candarins. The East India Company take the tael only at 6s. 720 taels=1,000 dollars of Spain.
The exchange on London is 4s. 8d. more or less, for one Spanish dollar.

WEIGHT.

1 pecul=100 cattys (gin), a 16 taels (lyang), a 10 mazas (tachen), or 10 candarins (twin), a 10 cash (li).
1 pecul = 133 1-3 pounds avoirdupois.
1 catty = 1 1-3 pound "
1 tael = 1 1-3 ounce "
1 catty (also the weight for gold and silver) =1 pound 7 3-5 ounces troy English; 1 tael=579 4-5 grains troy English.
The assay of gold and silver is done by 100 parts called toques. Silver must be 80-100 pure.

MEASURE.

The covid=14 5-8 inches English.
1 covid=10 punts.
The Chinese use 4 different feet:
For mathematics = 13 1-8 inches English.
For builders = 12 1-15 "
For engineers = 12 2-3 "
For trade = 13 1-3 "
1 li=180 fathoms of 10 feet of the engineers=2-5 of an English mile.

DENMARK.

(*Principal Commercial City*, COPENHAGEN.)

MONEY.

rigsd.	skil.	£	s.	d.	$	c.	m.
9	16	= 1	0	0	= 4	84	0
0	44	= 0	1	0	= 0	24	2
0	3¾	= 0	0	1	= 0	02	0 2-12
7	50 or 1 Christian d'or	= 0	16	3	= 3	93	2 6-12
2	0 or 1 species silver	= 0	4	4	= 1	04	8 8-12
1	0	= 0	2	2	= 0	52	4 4-12
0	16 or 1 mark	= 0	0	4½	= 0	09	1

1 rigsb. daler is equal to 96 skillings.
2 rigsbank daler=1 specie daler=3 mark banco in Hamburg.
1 rigsbank daler=2s. 3d. English.
1 skilling=1 farthing=half a cent American.

Bank notes in specie daler are freely taken—100 specie daler for 200 rigsbank daler.

They draw generally on Hamburg at sight or 14 days after date, and the exchange on London is 9½ rigsbank daler for £1 sterling. Exchange on Paris (rarely) from fr. 2.60 to fr. 2.70 per rigsbank daler.

WEIGHT.

1 pound=1 pound 1 5-8 oz. avoirdupois.
1 pound=16 ounces=32 loth=128 quents.
1 ship-pound=320 pounds.
1 last=16¼ do. or 52 cwt. of 100 pounds.

Gold and silver are sold by the pound=2 marks =16 ozs.=512 orts=8192 es. 1 mark=7 ozs. 4 1-5 dwts. Troy.

MEASURE.

1 foot=12 1-3 inches English.
1 ell=24 2-3 inches English.
1 mile=4 2-3 miles English.

FOR CORN.—1 toende=8 skieps=32 viertels.
1 toende=30 gallons 4⅓ pints English.
1 skiep=3 gallons 6½ pints English.
1 last=22 toen des.

EAST INDIES.

(*Principal Commercial Cities*, BOMBAY, BENGAL, CALCUTTA, *and* MADRAS.)

rup's.	ann.	pi.	£	s.	d.	$	c.	m.
10	8	0	= 1	0	0	= 4	84	0
0	8	4	= 0	1	0	= 0	24	2
0	0	8	= 0	0	1	= 0	02	0 2-12
16	0	0 gold mohur	= 1	9	0	= 7	01	8
1	0	0 rupee sicca	= 0	1	10½	= 0	45	3 9-12
0	8	0 half rupee	= 0	0	11¼	= 0	22	6 21-24

1 rupee is equal to 8 annas or 96 pice.

More particularly—

CALCUTTA. MONEY.

The Company's rupee=15-16 sicca rupee=1s. 11d. =$0.46.
1 rupee=16 anas; 1 ana=12 pice
COIN.—Gold: 1 mohur=15 rupees=33s. 2d. English=$8.02.6 4-12. Silver: 1 sicca rupee=2s. English=$0 48.4.

WEIGHT.

1 maund (factory maund), a forty seers, a 16 chattacks
1 maund=74 pounds 10 ounces avoirdupois.
1 seer=29 7-8 ounces avoirdupois. The bazaar weight is 10 per cent. heavier.
1 sicca=10 massa a 32 grains, or 4 punkhos.
1 sicca=178⅔ grains troy Eng.

MEASURE.

1 cubit=18 inches English. 1 guz=1 yard Eng.
1 coss=4,000 cubits=1 ⅛ mile English.

Corn is sold by the khahoon of 40 maunds or 16 soallis a 20 pallies. 1 pallie=9½ pounds avoirdupois.

MADRAS. MONEY.

The same as Calcutta.

WEIGHT.

1 candy=20 maunds=160 vis=6,400 pollams.
1 candy=500 lbs. avoirdupois.

MEASURE.

Long measure the same as Calcutta.

FOR CORN—1 garee=400 mercals a 8 puddys or 84 allocks.
1 garee=135 bushels.

BOMBAY. MONEY.

1 rupee=100 reas. Value as in Calcutta.

Exchange on London, 2s., more or less, for 1 Company's rupee.

WEIGHT.

1 candy=20 maunds a 40 seers a 30 pice.
1 candy=560 lbs. avdp.

MEASURE.

1 covid=18 inches English.

FOR CORN.—1 candy=8 parahas a 16 adowlies.
1 candy=24½ bushels.

EGYPT.

(*Principal Commercial City*, ALEXANDRIA.)

MONEY (at par.)

piast.	par.	£	s.	d.	$	c.	m.
97	20	= 1	0	0	= 4	84	0
5	0	= 0	1	0	= 0	24	2
0	17	= 0	0	1	= 0	02	0 2-12
50	0 gold new sequin	= 0	10	4	= 2	50	0 8-12
12	0 silver new piast.	= 0	3	4	= 0	80	6 8-12
4	0 silver grush.	= 0	1	2	= 0	28	2 4-12
1	0 piaster	= 0	0	2½	= 0	05	0 5-12

Wholesale payments are made in purses of 500 current piasters, chiefly in Span. dollars or piasters. 1 Sp. dollar=20 Egypt. piast.

1 piaster in Alexandria has 40 medinis or paras, or 100 good or 120 current aspers.
In Cairo 1 piaster=80 aspers or 33 paras.

COIN.—Ducatillo a 10, griscio a 30, piaster a 40, mahouib a 90, and zumabob a 120 paras. Also, zenzerli a 107, and mecchini a 146 zedinis.
Cotton is sold by cantaros. 1 cantaro=115 lb. Eng.
Coffee and Cotton are invoiced in Span. dollars.
Other goods in Egyptian Piasters.

Exchange on London, 80 piasters, more or less, for £1 sterling.
Exchange on Paris, 315 a 320 per fr. 100.

WEIGHT.

1 cantaro a 100 rotoli.

The rotoli differ. There are rotolo forforo=15 oz.; rotolo zauro=33⅓ oz.; rotolo zadino=21 5-16 oz.; rotolo mina=28 5-7 oz.

The quintal of coffee in Cairo=103 3-5 lb. Eng.
1 oka=400 drachmas a 16 carat a 4 grain.
1 oka=3 lb. 2 oz. 17 2-5 dwt. Troy.
1 drachma=1 dwt. 22½ grs.

MEASURE.

1 pik=26 4-5 in. Eng.
FOR CORN.—1 rebebe=36 gallons Eng.
1 kisloz=39 galls. Eng.

FRANCE.

(*Principal Commercial City*, PARIS.)

MONEY (at par.)

frs.	cts.	£	s.	d.	$	c.	m.
25	0	= 1	0	0	= 4	84	0
1	25	= 0	1	0	= 0	24	2
0	10	= 0	0	1	= 0	02	0 2-12
20	0 or gold Napoleon	= 0	16	0	= 3	87	2
5	0 or silver do.	= 0	4	0	= 0	96	8
1	0 do.	= 0	0	9½	= 0	19	1 7-12
0	10	= 0	0	1	= 0	02	0 2-12

1 franc weighs 5 grammes=100 centimes.

COIN.—Gold pieces of 100, 40, 20 and 10 francs.
Silver pieces of 5, 2, 1, ½ and ¼ francs.

Bank notes of 500 and 1000 francs.
Exchange on London, fr., 25.50 for £1 sterlg.
Exchange on New York, fr. 5.25 to 5.30 for $1.

WEIGHTS.

Milligramme	=	0.0154 grs.
Centigramme	=	0.1543
Decigramme	=	1.5434
Gramme	=	15.4340
Decagramme	=	154.3420
or 5.64 grams avoirdupois.		
Hectogramme	=	32.154 oz. troy,
or 3-527 oz. avoirdupois.		
Kilogramme=2 lbs. 8 oz. 3 dwt. 2 grs. troy.		
or, 2 lbs. 3 oz. 4.652 drams avoirdupois.		
Myriogramme	=	26,795 lbs. troy,
or 22.0485 lbs. avoirdupois.		

Quintal=1 cwt. 3 qrs. 25 lbs. nearly.
Millier or bar=9 tons 16 cwt. 3 qrs. 12 lbs.
The weight of 1 cubic centimetre of pure water is taken as the foundation. It is called gramme.
1 myriagramme=10 kilogr.=100 hectogr. = 1000 decagr.=10,000 grammes.
1 gramme=10 decigr.=100 centigr.=1000 milligr.
1 gramme=15 2-5 grains troy.
Or the kilogr.=15434 grains troy.
373 1-4 grammes=1 lb. troy.
453 3-5 grammes=1 lb. avdp.
1 kilogr.=2 lb. 3 1-4 ounces avdp.
1 quintal=100 kilogr.=220½ lb. avdp.

MEASURES.

Long Measure.

French.		English.
Millimetre	=	0.03937 in.
Centimetre	=	0.39371
Decimetre	=	3.93710
*Metre**	=	39.37100
Decametre	=	32.80916
Hectometre	=	328.09167
Kilometre	=	1093.63890
Myriometre	=	10936.38900
or 6 miles, 1 furlong, 28 poles.		

1 myriametre=10 kilometers=100 hectometers=1000 Decam=10,000 Metres.
1 metre=10 decimetres=100 centimetres=1000 millimetres.
The metre is the 10,000,000th part of the northern meridian quadrant.
1 metre=39 7-25 in. Eng.
1 lieue=1 myriametre=6 ⅞ Eng. mile.
1 aune=1 1-5=47 1-6 in. Eng.

Measure of Capacity.

Millitre	=	0.06103 cub. in
Centilitre	=	0.61028
Decilitre	=	6.10280
Litre†	=	61.02803
or 2.1135 wine pints.		
Decalitre	=	610.28028 cub. in.
or 2.642 wine gallons.		
Hectolitre	=	3.5317 cub. ft.
or 26.419 wine gallons, 22 imperial gallons, or 2.839 Winchester bushels.		
Kilolitre	=	35.3171 cub. ft.
or 1 tun and 12 wine gallons.		
Myriolite	=	353.17146 cub. ft.

For Wine, &c.—1 litre=1 cubic decimetre.
1 myrialitre=10 kilol.=100 hectol.=1000 decal.=10,000 litres.
1 litre=10 decil.=100 centil.=1000 millit.
1 litre=1¾ pints Eng.
1 hectolitre=22 gallons Eng.

Superficial Measure.

Centiare	=	1.1960 sq. yds.
Are (a sq. decametre)	=	119.6046
Decare	=	1196.0460
Hectare	=	11960.4604
or 2 acres, 1 rood, 35 perches.		

Solid Measure.

Decistere	=	3 5317 cub. ft.
Stere a (a cubic metre)	=	35.3174
Decastere	=	353.1741

* *Metre* is the fundamental unit of weights and measures; it is the ten-millionth part of the one-fourth of the terrestrial meridian.
† A cubic decimetre.

FRANKFORT ON THE MAIN

AND THE SOUTHERN PARTS OF GERMANY.

MONEY.

1 gulden a 60 kreuzers a 4 pfennings.
1 gulden=$0.40=3 kreutzers=0.02.
Coin.—Ducats a 2.20.
Pieces of 3¼ gulden=1.40; 1 guld.=$0.40, and half gulden=$0.20.
Old pieces of 2 2-5 gulden=$0.96; ½=$0.48.
Exchange on London, 120 fl., m. or l., for £10 stg.
" Paris, fr. 2.10 a 2.15 per fl.

MONEY (at par).

fl.	kr.		£	s.	d.		$	c.	m.
12	0	=	1	0	0	=	4	84	0
0	86	=	0	1	0	=	0	24	2
9	48	or g. Louis-d'or =	0	16	1	=	3	89	2 2-12
5	35	or gold ducat =	0	9	3	=	2	23	8 6-12
2	42	or silver crown =	0	4	4	=	1	04	0 8-12
1	0	=	0	1	8	=	0	40	3 4-12

1 florin is equal to 60 kreutzers.

WEIGHT.

1 cwt.=100 great or heavy pds.=108 small or light pds.
1 lb. heavy=17⅝ oz. avdp.
1 lb. light=2 mark=32 loth=128 quent=512 pfennig=15 1-20 oz. troy.
1 mark=7oz. 10½ dwts. troy.
1 cwt. of 100 heavy or 108 light lbs.=111 lbs. avdp.
Gold and silver are sold by the mark.
1 carat of jewels=1 dwt. 7 5-7 grains troy.

MEASURE.

1 foot=11¼ in. Engl.
1 foot=12 zoll=144 lines.
1 ell=21 5-9 in. Eng.
1 Francfort Brabant ell=27 2-3 inches Eng.
For Corn.—1 malter a 4 simmer a 4 sechter a 4 gescheide.
1 malter=3 bush. 1¼ gall. Eng.
1 simmer=6 5-16 galls. Eng.
For Liquors.—1 ohm a 80 maas a 4 schoppen.
1 maas=1 gescheid=30 5-32 pints, Eng.
1 ohm=31 5-16 galls.
1 fuder=6 ohms; 1 stuck=8 ohm.

GERMANY.

There can be properly no classification under this general head. See Frankfort on the Main, which is the principal commercial town of Germany.

GREECE.

(*Principal Commercial Cities*, Athens, Nauplia, *etc.*)

MONEY.

drach.	lept.		£	s.	d.		$	c.	m.
28	15	=	1	0	0	=	4	84	0
1	30	=	0	1	0	=	0	24	2
0	11	=	0	0	1	=	0	02	0 2-12
40	0 or gold piece =	1	10	6	=	7	38	1	
5	0 or silv. piece =	0	3	9	=	0	90	7	6-12
1	0	=	0	0	8¾	=	0	17	6 11-24

1 drachme is equal to 100 leptas.

HAMBURG & LUBECK.

(*Commercial Cities of* Germany.)

MONEY.

mk.	c.	schil.	pfen.		£	s.	d.		$	c.	m.
16		8	0	=	1	0	0	=	4	84	0
0		13¼	0	=	0	1	0	=	0	24	2
0		1	3	=	0	0	1	=	0	02	0 2-12
8		0	0 or 1 ducat. =	0	9	3	=	2	23	8 6-12
3		0	0 or 1 dol.cur. =	0	4	4	=	1	04	8 8-12
1		0	0	=	0	1	2½	=	0	29	2 6-12
0		1	0	=	0	0	0¾	=	0	01	5 3-24

1 mark currant is equal to 16 schillings.
1 thaler=3 marks=48 schillings; but they have two different values.
1st—according to the coin, called current;
2d—Imagined, used in trade, and called banco, generally 25 per cent. better than current.
1 mark currency=$0.26.
Exchange on London, 14 marks banco, m. or l., for £1 sterling.
" on Paris, fr. 1.50 to fr. 1.70 per mark banco.

WEIGHT.

1 pound=16¼ oz. avoirdupois Eng.
1 pound=32 loth a 4 quent.
1 centner=111 lbs.=119½ lbs. Eng.
1 ship pound=2½ cwts.=20 lies pound.
1 lies pound for shipping=14 lb.
1 " " land carriage=16 lbs.
1 stone flax, " " =20 "
1 " wood, etc. " " =10 "
For jewels the weight is the same as Berlin.

MEASURE.

Hamburg.	English.
1 foot	= 11.289 in.
100 commercial lbs.	= 106.838 lbs.
100 feet	= 94.021 feet.
100 ells	= 62.681 yds.
100 viertels	=159.39 imperial gallons.
100 fass	=18.135 imperial qurs.
1 last	=11 imperial qrs.
1 ship last	=3 tons

1 foot=12 zoll=96 achtelzoll.
1 Rhineland foot in Hambro'=12⅓ inches Eng.
1 Hambro' ell=22⅝ inches Eng.
1 Brabant ell in Hambro'=27 inches Eng.
1 Hambro' mile=4 3-5 English miles.

GRAIN.

Corn—Is sold by the last a 3 wispel a 10 scheffel a 2 wispel a 10 scheffel a 2 fass.
Barley—Is sold by the stock a 3 wispel a 10 scheffel a 3 fass.
1 fass=1 bushel 3 galls. 4¼ pints Eng.
1 scheffel=2 bush. 7 galls. 1 pint.
1 wispel=29 bush.
1 last=10 quarters 7½ bush.

HOLLAND.

A part of the Netherlands.

(*Principal Commercial Cities*, Amsterdam, Haarlem, the Hague, Rotterdam, Leyden, etc.)

MONEY (at par.)

guilder.cts.	£ s. d.	$ c. m.
12 0	= 1 0 0	= 4 84 0
0 60	= 0 1 0	= 0 24 2
0 5	= 0 0 1	= 0 02 0 2-12
10 0 g. 10 fl. piece	= 0 16 6	= 3 99 3
5 55 or ducat	= 0 9 3	= 2 23 8 6-12
1 0 or silv. florin	= 0 1 8	= 0 40 3 4-12

1 guilder is equal to 100 cents.

WEIGHTS AND MEASURES.

Dutch.	English.
1 foot	= 11 1-7 in.
1 ell	= 27 1-12 in.
1 last for corn	= 10 qrs. 5 1-4 bush. Winchester measure.
1 aam	= 41 wine gallons.
1 hoed	= 5 chaldr. Newcastle.
1 last for freight	= 4000 lbs.
1 last for ballast	= 2000 lbs.

LOMBARDY.

(*Principal Commercial Cities*, Venice *and* Milan.)

MONEY.

1 lira Austriaca=100 centesimi or 20 soldi a 5 centesimi.
1 lira Austriace=$0.16.
The Austrian is the current coin under other names.

2 gulden=1 scudo nuovo =$0.96.
1 gulden=½ scudo nuovo =$0.48.
½ gulden=¼ scudo nuovo =$0.24.
¼ gulden=1 lira Austriaca =$0 16.
Exchange on London, 30 lira Austriache m. or l. for £1 sterlg.
Exchange on Paris, fr. 85.00 m. or l. per l. Aust. 100.

WEIGHT.

1 libbra=1 kilogramme=2 lb. 3 1-4 oz. avdp.
1 libbra=10 oncie=100 grossi=1000 denari.
1 quintale=100 libbre.
1 rubbo=10 libbre.

MEASURE.

Equal to the French.

1 metro=10 palmi=100 diti=1000 adomi.
1 miglia=1000 metri.
Corn—1 soma=1 hectolitre, French.
1 soma=10 mine=100 pinta=1000 coppi.

MEXICO & MONTE VIDEO.

Mexico, *Capital of Republic of Mexico.*
Monte Video, *Capital of Republic of Uraguay, or Banda Oriental, S. A.*

Mexico. MONEY.

dols. reals.	£ s. d.	$ c. m.
16 0 or gold doubloon	= 3 5 0	=15 73 0
8 0 or ½ do	= 1 12 6	= 7 86 5
4 0 or 1-4 do	= 0 16 3	= 3 93 2 6-12
1 0 or 1-16 do	= 0 4 0	= 0 96 8
1 0 silv. dol., 8 reals	= 0 4 2	= 1 00 8 4-12
0 4 do. ½ dol.	= 0 2 1	= 0 50 4 2-12
0 2 do. 1-4 dol.	= 0 1 0½	= 0 25 2 1-12
0 1 do. 1-8 dol.	= 0 0 6½	= 0 12 6 1-24

1 dollar is equal to 8 reals.
1 peso a 8 reales de planta a 4 cuartos.
1 peso=1 dollar U. S. currency.
The piastre or duros of 1833 and 1834 are about 6 per cent. less value.
Coin—Gold doblones, a 16 duros.
1-2, 1-4 and 1-8 do.
Silver duros or dollars.
Reales and 1-2 reales.

Monte Video. MONEY.

The peso or duro a 8 reales de plata a 100 centesimos.
This peso is not equal with the Spanish or Mexican, and is generally called the peso corriente.
1 peso corriente=$0.80, or 5 pesos corrientes=4 pesos duro—Spanish silver dollar.
Exchange on London=52 d. sterling for 1 peso duro.

MEASURE AND WEIGHT.

108 varas—100 yards English.
For the rest, see Spain.

NAPLES.

(*Principal Commercial City* Naples *the Capital*)

MONEY.

ducat. grani.	£ s. d.	$ c. m.
6 3	=1 0 0	= 4 84 0
0 30	=0 1 0	= 0 24 2
0 2½	=0 0 1	= 0 02 0 2-12
30 0 piece of	=5 0 0	=24 20 0
1 0 silver ducat	=0 3 4	= 0 80 6 8-12
0 120 or dollar	=0 4 0	= 0 96 8
0 20 piece of	=0 0 8	= 0 16 1 4-12
9 10 piece of	=0 0 4	= 0 08 0 8-12

1 ducat is equal to 100 grani.
Ducati di regno a 10 carlini a 10 grani.
1 ducato $0.90.
Coin—Gold pieces of 6, 4 and 2 ducati, and pieces of 3 ducati or 1 oncia, and pieces of 2, 5 and 10 oncie.
Silver pieces of 12, 10, 6, etc., carlini.
Scudi of 12 carlini and ducati in silver of 10 carlini.
Exchange on London, 575 grani per £1 sterlg.
Exchange on Paris, 22 a 25 grani per 1 fr.

WEIGHT.

1 cantaro=100 rottoli a 33 1-3 oncie.
1 rotolo=1 lb. 15 3-7 oz. avdp
The libbra for gold, silver, etc., has 12 oz.
360 trappesie, 7200 acini.
1 libbra=10 oz. 1 1-4 dwts. troy.

MEASURE.

1 palmo=12 oncie=60 minuti=120 punti.
1 palmo=10 10-27 in. Eng.
1 canna=8 palmi=2 1-3 yards Eng.

CORN—1 carro a 36 tomoli a 24 mass or 1 tomolo a 2 mezzetti a 4 quarti a 8 stoppeli=12 galls. 1½ pints English.

WINE—1 carro=2 batti=24 barrili=1440 caraffi, in the country 1584 caraffi.

1 barile=9 1-8 gallons, 1 caraffo=1 5-22 pints.
Oil is sold by the salma a 16 staji a 256 quarti or 1536 misurelle, and weighs about 350 lbs Eng.
The salma of Bari is about 312 and of Gallipoli only 295 lbs. Eng.

1 quarto in measure=5-6 pint.
1 staja in measure=27 galls.

THE NETHERLANDS.

(*Principal Commercial City*, AMSTERDAM.)

MONEY.

1 gulden=100 cents=1s. 8d. English=$0.40.3 4-12
5 cents=1 stuiver=1d. English=$0.02.0 2-12.
2½ guilders=$1.

COIN.—Gold pieces of 10 and 5 gulden. Silver pieces of 3 and 1 gulden, 50, 25, 10 and 5 cents.

Old Gold Coin.—Ducats weighing 52 4-5 grains English, double ducats, ryders=14 gulden.

Butter is sold by the ton, which differs from the common ton=336 pounds Holl. 1 pound=1 5-12 avoirdupois. 1 ship-pound=300 pounds.

Exchange on London, 11 g. 80 cents, more or less, for £1 sterling.

Exchange on Paris, 2 fr. 10 cts., more or less, per gulden.

WEIGHT.

lb.		lood.		wigtj.		korrels.
1	=	10	=	100	=	1000
		1	=	10	=	100
				1	=	10

1 lb.=1 lb. 1 5 8 oz. Avdp.

MEASURE.

The Ell=1 French metre=39 3-8 inches Eng.

roede.		ell.		palm.		duim.		streep.
1	=	10	=	100	=	1000	=	10,000
		1	=	10	=	100	=	1,000
				1	=	10	=	100
						1	=	10

1 myl (mile)=1000 ells=⅝ mile English.
FOR CORN.—1 mudde=2 bushels 6⅓ gallons.
1 mud=10 schepel=100 kop=1000 maajtes.
1 last=30 mudden.

FOR LIQUORS.—1 vat=22 1-10 gallons English.
1 vat=100 kann=1,000 maatj.=10,000 vingerh.

NORWAY.

(*Principal Commercial City*, CHRISTIANA.)

MONEY.

sp. dol.	skil.	£	s.	d.	$	c.	m.
4	75	=1	0	0	=4	84	0
0	28	=0	1	0	=0	24	2
0	2¼	=0	0	1	=0	02	0 2-12
0	24 or 1 mark	=0	0	9½	=0	19	1 7-12
1	0 specie dollar	=0	4	4	=0	01	8 8-12
0	60 or 1 rigsb. dol.	=0	2	2	=0	52	4 4-12
0	1 nearly	=0	0	0½	=0	01	0 1-12

1 specie dollar is equal to 120 skillings.

POLAND.

Principal Commercial City, WARSAW.

MONEY.

fl.	grosch.	£	s.	d.	$	c.	m.
42	0	=1	0	0	=4	84	0
2	3	=0	1	0	=0	24	2
0	5	=0	0	1	=0	02	0 2-12
18	15 or 1 gold ducat	=0	9	3	=2	23	8 6-12
8	0 or 1 rix dollar	=0	4	0	=0	96	8
1	0 or 1 silver florin	=0	0	5¾	=0	11	5 23-24

1 florin is equal to 30 groschen.
Formerly the gulden a 30 graschm Polish.
1 gulden=$0.11½ cents.

At present the Russian coin is the only legal tender.

Bank notes of the Polish National Bank of 5.50 and 100 guilders.

Exchange on London, 32 Polish gulden m. or l. for £1 sterling.

Exchange on Paris, fr. 60.50 a fr. 60.75 per 100 gulden.

WEIGHT.

1 funt (lb.) 14 7-16 ounces avdp.
1 funt (lb.) 13⅓ ounces troy.
1 lb.=16 ounces=32 loth=128 drams a 3 scruples a 24 grains.
1 centner=3 stones=100 lbs.=87 7-8 lbs. avdp.
Wool is sold by the stone of 32 lbs.

MEASURE.

1 foot (stopa)=11⅓ inches Eng.
1 ell (lokiee)=25 inches Eng.
1 mile=8 wersts=5 miles Eng.
CORN—1 kwart=2 litre=1¾ pint Eng.
1 korzek=128 kwarts=28 galls. Eng.

PORTUGAL.

(*Principal Commercial City*, LISBON.)

MONEY.

reis.	£	s.	d.	$	c.	m.
4120	=1	0	0	=4	84	0
206	=0	1	0	=0	24	2
20 or 1 vintem	=0	0	1⅙	=0	02	2 33-48
6400 or gold Joannose	=1	16	0	=8	71	2
1000 silv. crwn. or mil reis	=0	4	8	=1	12	9 4-12
400 or crusado	=0	2	3	=0	53	4 6-12

1 mil reis is equal to 1000 reis.

Accounts are kept in reis.
1 milrei (or 1000 reis)=2 1-12 new=2½ old cruzados=10 testons=25 reales; 1 rei=6 ceitis.
1 conto de reis (1 million reis)=£270 sterling=$1296 (the dollar at the rate of 50 pence Eng.)
1 milree=$1.25.
1 crusado velho=about $0.50.
1 crusado novo=about $0.60.

COIN—Gold pieces of 24 and 12 thousand reis=$16.80 and $33.60.
Silver pieces 1, ½, ¼, ⅛ cruzado.
Exchange on London, 1 milrei for 59 pence.
" on Paris, fr. 6.20 a fr. 6.30 per milrei.

WEIGHT.

1 quintal a 4 arrobes a 32 libras a 2 marcas.
1 libra=1 lb. avdp. Eng.
GOLD AND SILVER—1 marco=8 oncas=64 outavas=4608 grainos.
1 marca=½ lb.=8 8-20 ounces troy.
151 carats of jewels=1 ounce English troy.

MEASURE.

The pe=12 ¾ inches Eng.
The vara=43 4-5 inches Eng.
The covado=26 7-10 inches Eng.
The passo geometrico=1½ vara.
1 mile=4 miles Eng.
CORN is sold by the mayo a 15 fanegas a 4 alqueiras a 4 quartos a 8 selamis.
1 moyo=23 bushels Eng.
1 fanega=11⅞ gallons Eng.

WINE AND OIL.—1 tonelada a 2 pipas or botas =52 almudas=104 alquires or potes & 624 canadas.
1 almude of Lisbon=3 galls. 5 pints Eng.
1 " Oporto=5 galls. 5 pints Eng.
1 canada=13 1-16 pints Eng.

PRUSSIA.

(*Principal Commercial City*, BERLIN.)

MONEY.

thal.	sg.	pf.		£ s. d.	$ c. m.
6	20	0		=1 0 0	=4 84 0
0	9	9		=0 1 0	=0 24 2
0	0	10		=0 0 1	=0 02 0 2-12
5	20	0	gold Frederick	=0 16 9	=4 05 3 6-12
1	0	0	silver thaler	=0 3 1	=0 74 6 2-12
0	1	0	silver groschen	=0 0 1¼	=0 02 5 5-24

1 thaler=30 silver groschen a 12 pfenning.

COINS—Friedrichs d'or=16s. 6d. English=$3.96 Double do. 33s.=$7.92. Half do. 8s. 3d.=1.98. In silver pieces of 2, 1, ½, ¼, 1-6, 1-12 thaler. Do. of 2, 1, ½ groschen.

Bank notes of 1, 5, 50, 100, 500 thaler freely taken in the whole of Germany for their nominal value.

Wool is sold by the stein of 22 pounds=22⅔ pounds avoirdupois.

Exchange on London, 6 thalers 25 gr., more or less for £1 sterling. Do. Paris, fr. 3.75, more or less, per thaler.

WEIGHT.

1 pound=467 7-10 grammes French=1 1-32 pound avoirdupois.
1 cwt.=110 pounds Pr.=113 7-16 lbs. avoirdupois.
1 last (shipping) is 4000 pounds.

Gold and silver are sold by the mark=½ pound =7 oz. 10⅓ dwts. troy English.

The mark is=288 grains.

For assay of silver the mark is divided into 16 loth a 18 grs. ; and of gold into 24 carats a 12 grs.
1 carat of jewels is=9.160 quent=1 dwt. 7 5-7 grains troy.

MEASURE.

The foot=12⅓ inches English.
1 ruthe=12 feet=144 zoll=1728 linien.
1 ell=2⅔ zoll=26¼ inches English.
1 faden=6 feet. 1 mile=4 2-5 miles Eng.
FOR CORN.=1 scheffel=1 ½ bushel.
1 scheffel=16 metz; 24 scheffel=1 wispel.

ROME.

(*Capital of the* PAPAL STATES.)

MONEY.

paoli.	baj.			£ s. d.	$ c. m.
46	0			=1 0 0	=4 84 0
2	5			=0 1 0	=0 24 2
0	2			=0 0 1	=0 02 0 2-12
100	0	gld.	10 scudi piece	=2 2 6	=10 28 5
10	0	silver	scudo	=0 4 2	=1 00 8 4-12
1	0			=0 0 5	=0 10 0 10-12

1 paoli is equal to 10 bajochi.

RUSSIA.

(*Principal Commercial City*, ST. PETERSBURG.)

MONEY.

roubl.	kop.		£ s. d.	$ c. m.
6	33		=1 0 0	=4 84 0
0	32		=0 1 0	=0 24 2
0	2⅝		=0 0 1	=0 02 2 2-12
5	15	gold half imper.	=0 16 3	=3 93 2 6-12
3	0	ducat	=0 9 2	=2 21 8 4-12
1	0	silver rouble	=0 3 2	=0 76 6 4-12

1 rouble is equal to 100 kopeks.

COIN—Gold imperials of 10 and 5 roubles (silver) Silver, rouble, and pieces of 75, 50, 40, 30, &c., to 5 kopeks silver.

Bank notes from 1 to 1000 roubles silver.

Exchange on London, from 39d. to 42d. for 1 rouble silver.

Exchange on Paris, from fr. 4.10 to fr. 4.20 per rouble silver.

WEIGHT AND MEASURE.

RUSSIAN.	ENGLISH.
1 arsheen*	= 28 in.
1 sashen†	= 7 ft.
100 feet	= 114⅓ feet.
1 werst	= 5 fur. 12 poles.
1 lb.	= 6318 5 grs.
100 lbs.	= 90.26 lbs. avdp.
1 pood	= 36 lbs. 1 oz. 11 drs.
1 chetwert	= 5.952 Winc. bush.
100 do.	= 74.4 quarters.
1 wedro	= 3¼ wine gallons.

More particularly

WEIGHT.

1 pound (funt)=14½ oz. avdp.
1 pood=40 lb.=36¼ lbs. avdp.
1 bercowitz=10 poods=362½ lbs. avdp.
1 bruttolast=6 chetwerts.
(The funt is=95 solotnick. 1 sol.=96 doll.)

MEASURE.

1 foot = 1 foot Eng.
1 arsheen = 28 in. Eng.
1 sashen = 3 arsheens.
1 sashen=3 arsheens=7 feet=48 worschecks=84 inches=1008 lines.
1 werst=500 sashen=⅝ mile Eng.

CORN, &c.—1 chetwert=4 pajok.
8 tschetwerick=32 tschewerks=64 garner.
1 chetwert=5 bushels 6 gallons 2 pints Eng.
1 tschetwerick=5 7-9 gallons Eng.
1 kuhl or sark=10 tschetwericki.
1 wedro=2¾ galls. Eng.
1 fass=40 wedroja.

SARDINIA.

(*Principal Commercial Cities*, GENOA *and* TURIN.)

MONEY.

The lira nuova=1 franc a 100 centesimi=9¼ d. English=$0.18½.

COIN—Gold: Pieces a 20, 40, 80 and 100 lire nuove or $3.75, $7.50, $15, and $18.75. Silver: scudi d'argento a 5 lire nuove. Pieces of 2 and 1 lire and 50 and 25 centesimi.

Bank notes of 5, 10 and 20 scudi.

Exchange on London, 25 50 lire, more or less, for £1 sterling.

Exchange on Paris, 21 lire per fr. 20.

WEIGHT.

IN GENOA. 1 peso grosso=12 1-6 oz. avdp.
1 peso sottile=1 lb. 18 grains troy.
IN TURIN. 1 libbra=13 oz. avdp.
The Customs use the French kilogramme.
Gold and silver weight is the marco=8 uncie a 24 denari a 24 grani.
1 marco=8 oz. troy.

MEASURE.

IN GENOA. 1 palmo=9 ¾ inches Eng.
FOR CORN—1 mina=3 bush. 2½ galls. En g.
1 mina=8 quarti=96 gombette.
FOR WINE—1 barile=16½ galls. Eng.
1 mezzarola=2 barili=100 pinte.
FOR OIL—1 barile=14 ¼ galls. Eng.
IN TURIN. 1 piede liprando=1 ft. 8½ in. Eng.
1 piede manelle=12¾ in. Eng.
1 raso (ell)=23⅛ in. Eng.
FOR CORN—1 sacco=5 emine a 8 copi a 24 cucchiari.
1 sacco=25½ galls. Eng.
FOR WINE—1 brenta=10 4-5 galls.
1 carro=10 brenta a 36 pinte a 2 boccali.

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* 1 arsheen=28 inches Eng.
† 1 sashen=3 arsheens.

SAXONY.

(*Principal Commercial Cities* DRESDEN *and* LEIPSIC.)

MONEY.

rd.gn.pf.	£ s. d.	$ c. m.
6 15 0	= 1 0 0	=4 84 0
0 9 9	= 0 1 0	=0 24 2
0 0 10	= 0 0 1	=0 02 0 2-12
5 12½0 or August d'or	= 0 16 2	=3 91 2 4-12
1 10 0 or specie thaler	= 0 3 11	=0 94 7 10-12
1 0 0 currency	= 0 4 1	=0 74 6 2-12
0 1 0	= 0 0 1¼	=0 02 5 5-24

1 thaler a 30 groschen a 10 pfenninge.
1 thaler=2s. 11d. Eng.=$0 70.5 10-12.

COIN—August d'or=16s. Eng=$3.87.2.
Silver pieces of 2, 1, ½, 1-6 and 1-12 thaler.

Paper money is issued by the Government in notes of 10, 5 and 1 thaler.
By the Bank of Leipsic, in notes of 20, 100, 200, 500 and 1000 thalers.
Also 1 thaler notes by the Leipsic Dresden Railway Company.

Exchange on London, 6 thaler 25 groschen, more or less, per £1.

Exchange on Paris, fr. 3.75 per thaler.

WEIGHT.

1 lb.=1 lb. 1⅝ oz. avdp. Eng.
1 cwt.=100 lbs.=1000 millas.

For the retail trade the lb. is divided into 32 loths, a 4 quents.

MEASURE.

1 foot=11⅞ inches Eng.
1 ell=3-5 French metre=24 in. Eng.

FOR CORN—1 schaffel=100 litres French=22 galls. nearly.

12 schaffels=1 malter; 2 malters=1 wispel.
1 wispel=66 bushels Eng.

FOR LIQUIDS—1 oxhooft=1½ ohm=3 eimer=210 kanns.

1 fuder=4 oxhoofts.
1 kanne=1 litre=1¾ pints Eng.

SMYRNA AND THE LEVANT

MONEY.

Like Constantinople. In the Levant are likewise used to a great extent, Spanish dollars and Dutch, Hungarian and Venetian ducats. Likewise German Conventions thaler—$0 96 to $1, being subject to variation.

Exchange on London, 105 piasters, more or less, for £1.

Exchange on Paris, fr. 4.75 to fr. 5 per piaster.

WEIGHT.

1 cantarro=7½ battman=22½ chequis=45 okes=100 rotoli a 180 drachms.

The oka, as a gold and silver weight, has 400 drachms, and is equal to 3¼ lbs. Troy.

1 cantaro = 127 1-2 lbs. Troy.
1 rotolo = 1 lb. 4⅓ oz.

Goat's hair is sold by the chequi a 800 drachmas
Silk is sold by the teffei a 610 drachmas.
Opium is sold by the teffei a 250 drachmas.
1 drachm=49 3-5 grains Troy weight.

MEASURE.

1 pik = 27 in. Eng.

CORN—The killow=11⅝ galls.

SPAIN.

(*Principal Commercial City*, MADRID.)

MONEY.

dols.rls.	£ s. d.	$ c. m.
4 14 barley	= 1 0 0	= 4 84 0
0 5	= 0 1 0	= 0 24 2
16 0 or gold doubloon	= 3 6 0	=15 97 2
4 0 or gold pistole	= 0 16 6	= 3 99 3
1 0 or silver dollar	= 0 4 3	= 1 02 8 6-12
0 1 or real vellon	= 0 0 2⅝	= 0 05 3 45-48

1 dollar is equal to 20 reals.

They use eight different sorts of money:—

1. Castilian.
2. Mexican.
3. Catalonian.
4. Majorcan.
5. Valencian.
6. Arragon.
7. Navarre.
8. The Cauarian money.

The Castilian is the chief, and is 1 real de plate antigua=1 15-17 real de velon=16 cuartos=34 maravedis de plata antigua=64 marav. de vellon =640 Castil. dineros.

10⅝ reales de plata antigua=1 piaster.
1 piaster or duro=4s. 4d. Eng.=$1.04 8 8-12.
1 real de plata=5d. Eng.=$0.10.0 10-12.

COIN—Gold, 1 quadrupel pistole=8 escudos=$16 to $15.60=doblon or onza d'Oro=$16 subdivided into ½, ¼, ⅛ and 1-16. Peso duro or dollar need not be described.

Exchange on London, 40d. sterling, more or less, per peso de plata antigua=48d. to 52d. English, per dollar.

Exchange on Paris, fr. 5.10 a fr. 5.30 per peso duro.

WEIGHTS AND MEASURES.

SPANISH.		ENGLISH.
1 cana	=	21 inch. nearly.
100 "	=	58.514 yards.
100 quarteras	=	23.536 Win. qrs.
100 lbs.	=	88.215 lbs. avdp.

More particularly—

WEIGHT.

1 Castilian marca=8 1-7 oz. avdp. or 7 oz. 3 4-25 dwts. troy, Eng.
1 marca=8 onzas=64 ochaves=4608 granos.
1 quintal macho=6 arrobas=150 libras.
300 marcas=152½ lbs. avdp.
1 quintal=4 arrobas=100 libras=101¾ lbs. avdp.

Jewels and pearls are weighed by the Castilian ounce a 140 quilates, a 4 granos.

1 oz.=431½ grains troy.

MEASURE.

1 pie=11⅛ inches Eng.
1 estado=2 varas=6 pies=5 ft. 6¾ in. Eng.
1 league=4¼ miles Eng.

FOR CORN—1 cahir=12 fanegas a 12 celemines or almudos a 4 quartillos.

1 fanega=12½ galls. Eng.

FOR LIQUIDS—1 cantaro or arroba mayor=8 azumbres=32 quartillos.

1 arroba mayor=3 galls. 3¾ pints Eng.
1 arroba menor for oil=2 galls. 5½ pints Eng.
1 moyo=16 cantaros. 1 pipa=27 cantaros.
1 bota=30 cantaros.

SWEDEN.

(*Principal Commercial City*, STOCKHOLM.)

MONEY.

rd.	skil.		£	s.	d.	$	c.	m.
12	0	in banco	= 1	0	0	=4	84	0
0	23		= 0	1	0	=0	24	2
0	2⅓		= 0	0	1	=0	02	0 2-12
5	25	or 1 gold ducat	= 0	9	2	=2	21	8 4-12
2	25	or 1 specie silver	= 0	4	4	=1	04	8 8-12
1	0	banco	= 0	1	8	=0	40	3 4-12
1	12½	or half specie silver	= 0	2	2	=0	52	4 4-12

1 rd banco is equal to 48 skillings.
1 silver specics is equal to 96 skillings.
1 riksdaler specie a 48 skillings=$1.05.

Payments are, however, made chiefly in bank notes of 8, 10, 12, 14 and 16 skillings, and 2, 3, 5, 6, 9, up to 50 riksdaler.

Banco=1 riksdaler specie.

Exchange on London, 12 dalers banco for £1 sterg.
Exchange on Paris, fr. 2.10 to fr. 2.15 for 1 riksdal.

WEIGHT.

1 skal pound	=	15 oz. avdp.
1 schip pound	=	400 skal lbs.
1 cwt	=	120 lbs.
1 scale of spelter	=	165 " .
1 stone wool	=	32 "
1 mark (for gold)	=	6 oz. 16 dwt. troy.

MEASURE.

1 foot=1 foot Eng.
1 faam=3 alnar=6 feet=17 verthum.
1 alnar=2 ft. Eng.

CORN.—1 tonn=4 bush. Eng.
1 tonn=8 quarts=32 kappar=56 kans=448 quartiera.

WINE.—2 pipes=1 fuder=4 oxhoofte=12 eimer =720 stop.

SWITZERLAND.

(*Principal Commercial Cities*, GENEVA, BERN, BASLE.)

MONEY. Old System.

fr.	batz.	rap.	£	s.	d.	$	c.	m.
17	7	5	= 1	0	0	=4	84	0
0	8	7	= 0	1	0	=0	24	2
0	0	7	= 0	0	1	=0	02	0 2-12
4	0	0 piece of	= 0	4	8	=1	12	9 4-12
1	0	0 or 10 batz	= 0	1	1⅓	=0	27	2 3-12
0	1	0	= 0	0	1⅓	=0	02	6 32-36

A franc is equal to 10 batzen.

New System—as in France.

1 franc=10 batzen a 10 rappen or 1 livre a 20 sols a 12 derniers.
1 franc=1 livre=$0.27.

COIN.—Gold pistoles a 32 francs=$8 65.
" ½ pistoles a 16 francs=$4.32½.
" Ducats=$2.22.
Silver pieces of 40, 20, 10 and 5 batzen.

N. B.—Each Canton has besides these its own currency.

Exchange of Basle on London, 17 francs 5 rappes, more or less, for £1 sterling.

Exchange on Paris, fr. 1.50 per fr. 1, or 50 per cent. premium, more or less, in favor of Basle.

WEIGHT.

1 cwt.=100 lbs.=50 kilogrammes=110¼ lbs. avdp. Eng.
1 lb.=½ kilogramme=1 lb. 1⅝ oz. avdp. Eng.

MEASURE.

The basis is the Helvetian foot.
1 foot=3-10 French metre=11 17-20 in. Eng.
2 feet=1 ell; 4 feet=1 stab or staff.
16,000 feet=1 hour (mile) =3 Eng. miles.

FOR CORN.—1 malter=10 viertel=100 imir.
1 malter=4 bush. 1 gall. Eng.
1 immir=3½ pints.

FOR WINE.—1 ohm=100 mass (or measures).
1 ohm= 33 galls. Eng.
1 maas=3½ pints.

TURKEY.

(*Principal Commercial City*, CONSTANTINOPLE.)

MONEY.

pias.	par.		£	s.	d.	$	c.	m.
109	0		= 1	0	0	=4	84	0
5¾	0		= 0	1	0	=0	24	2
0	18		= 0	0	1	=0	02	0 2-12
200	0	gold new dbl. seq.	= 1	11	0	=7	50	2
100	0	" 1 seq.	= 0	18	0	=3	35	6
1	0		= 0	0	2¼	=0	04	5 9-24
22	0	or 1 Spanish dol'r	= 0	4	2	=1	00	8 4-12

Piaster a 40 paras a 3 aspers.
Also piaster (grush) a 100 aspers.
1 piaster=2½d. English=$0.05.
1 purse silver is 500 piasters.
1 purse gold is 30,000 piasters.
1 juk is 100,000 coined aspers.

The government or bank notes bear 8 per cent. interest.

Exchange on London, 104 piasters, more or less, for £1 sterling.

Exchange on Paris, from 400 to 410 piasters for 100 francs.

WEIGHT.

1 pound, chequi=11 oz. avoirdupois.
1 oka=2 lbs. 12 oz. avoirdupois.
1 oka=4 chequi=400 drachmas.
1 taffee=610 drachmas.
1 batman=6 okas.
1 cantaro=44 a 45 okas.

Gold and silver weight like Alexandria.
1 chequi opium=250 drachmas.
1 chequi goat-hair=800 drachmas.

PIECE GOODS.—1 mazzee=50 pieces.

MEASURE.

The large pik halebi, archim=27 9-10 inches Eng.
The small pik andassa=27 1-16 inches English.

FOR CORN.—The killows=7½ gallons English.
1 fortin=4 killows=30 gallons English.
1 killow of rice should weigh 10 okas.

FOR LIQUORS.—1 almud=1 2-5 gallon English.
1 almud of oil should weigh 22 5-8 pounds avoirdupois.

TUSCANY.

(*Principal Commercial Cities*, FLORENCE *and* LEGHORN.

MONEY.

1 lira Toscana=100 centesimi=7 4-5d. Eng.=$0.15 3-5.
1 lira Toscana=20 soldi=240 denari.
25 lire Toscane=21 francs.

COIN.—Gold:			
	Rusponi a 3 zecchini	=	$6 25
	Zecchini gigliati	=	2 05
	Half "	=	1 03
Silver:	Francesconi a Leopoldini	=	0 96
	Half "	=	0 48
	Tallari	=	0 92
	Testoni	=	0 30
	Lire a 12 crazie, about		15

Exchange on London, 30 lire, m. or l., per £1.
Exchange on Paris, 80 to 85 centimes per lira.

WEIGHTS AND MEASURES.

LEGHORN.		ENGLISH.
1 braccio	=	22 98 inches.
155 bracci	=	100 yards.
1 sacco	=	2.0739 Winchester bush.
4 sacci	=	1 imperial quarter nearly.
100 lbs.	=	74.864 lbs. avoirdupois.
1 centinajo	=	100 lbs.
1 rottolo	=	3 lbs.

More particularly—

WEIGHT.

1 quintal=100 lbs.=1200 uncie a 24 denari.
1 lb =12 oz. avoirdupois.
1 quintal=74⅞ lbs. avoirdupois.
FOR GOLD.—1 lb.=10 11-12 oz. troy, and is divided into 24 carati a 8 ottavi.
FOR SILVER, into 12 uncie a 24 denari.
Jewels are weighed by the caret a 4 grani.

MEASURE.

1 braccio = 23 inches, English.
1 mile = 1 mile, 48 yards, English.
The braccio used by builders=21 3-5 inches, Eng.
FOR CORN.—1 sacco=3 staja=6 mines;
100 sacchi=201 bushels.
FOR WINE.—1 barile=20 fiaschi=80 mazzette=160 quartuzzi=10 1-30 galls. Eng.
1 barile of oil=7⅞ galls. Eng.

SHIPPING MEASUREMENT.

FOR GRAIN.—42 cubic feet=1 ton shipping measurement.

1 bushel = 60 lbs.
1 bushel = 2218½ cubic inches.
8 bushels = 1 quarter.
1 quarter = 17745 cub. in. or 10.27 feet.

Therefore, 1 ton will take four quarters and one-tenth.

1 bushel being equal to 60 lbs ,
1 quarter will be equal to 480 lbs.,
1 ton=1968 lbs., or 17 cwt. 2 qrs. 0 lbs. fully.

One ship of 200 tons measurement can therefore carry 820 quarters, but it generally can carry much more.

Miscellaneous Table of Foreign Weights and Measures.

Arroba of Buenos Ayres,	=	25.36 lbs. U. S.
Amir, or Emir, of Stuttgard,	=	78 gallons.
Balsam Copaiva, 8 lbs.,	=	1 do.
Butt of Wine,	=	130 do.
Canado of Balsam Copaiva,	=	30 pounds.
Chaldron Coal, British Provinces,	=	36 bushels.
do. do. Cumberland,	=	53 do.
Cheki of Opium, from Smyrna	=	1⅝ pound.
Coal, railway wagon load, Pictou,	=	62 cwt.
Flax, head of, about	=	6¾ pounds.
Foot, 100 feet St. Domingo,	=	106 60-100 feet
Honey, 1 gallon,	=	12 pounds.
Linseed, one bushel,	=	47 do.
Mudd, or maud, of Rotterdam,	=	148 do.
Moye of Salt, Spain,	=	70 bushels.
Modius of Salt, from Ivica, Spain,	=	40 do.
do. do. Oporto and St. Ubes,	=	23 do.
Mass, of Antwerp, ¼ of ohm,	=	10 gallons.
Ohm do.	=	40 do.
Pounds of Austria,	=	100 lbs. = 123 60-100.
do Antwerp,		do. = 103 35-100.
do. Bavaria,		do. = 123.
do. Belgium,		do. = 103 35 100.
do. Brussels,		do. = 103 35-100.
do. Bremen,		do. = 109 80 100.
do. Berlin,		do. = 103 11-100.
do. Hamburg,		do. = 106 80-100.
do. Malaga,		do. = 101 44-100.
do. Netherlands,		do. = 108 93-100.
do. Portugal,		do. = 101 19-100.
do. Prussia,		do. = 103 11-100.
do. Rotterdam,		do. = 108 93-100.
do. Spain,		do. = 101 44-100.
do. St. Domingo,		do. = 107 93-100.
do. Trieste,		do. = 123 60-100.
do. Vienna,		do. = 123 60-100.
Palm of Italy, of marble,		do. = 6 inches.
Quintal of France,		do. = 220 54-100 lbs.
Skippond of Gottenburg,		do. = 300 pounds.
do. Gefle,		= 314 1-10 lbs.
Salt, 1 barrel	=	5½ bushels.
Vara, Spanish	=	8 feet.
Vara of Baracoa,	=	20 feet.

RATES OF FOREIGN MONEY OR CURRENCY, FIXED BY LAW.

The following condensed presentation of the United States value of Foreign Currencies, Weights and Measures, is, to a considerable extent, a repetition of what may be found in the foregoing Tables. It is here thus given, first for the greater convenience of this condensed form; and, secondly, as giving the specific values established by law in the United States, while that presented in the foregoing is the one recognized in London, estimated in Sterling Currency, and that reduced to Federal Currency, putting the pound at $4.84. The slight discrepancies between the two are thus accounted for, and the reader will bear in mind that the following are the popular values or rates at which these foreign coins pass in the United States.

The editor acknowledges his essential indebtedness for these to a volume entitled "United States Tariff," etc., published by Messrs. Rich & Loutrel, New York, to whose courtesy we are indebted for the use of these tables. In it may be found a great amount of valuable information to commercial men, respecting the rates of duties on foreign merchandise and other matters. The volume is compiled by E. D. Ogden, Esq., Entry Clerk in the New York Custom House, and is made the text-book in all the Custom Houses throughout the United States and by the Departments at Washington.

	$ cts.				
Ducat of Naples,	80	or	100 grani.		
Franc of France or Belgium,	18 6-10	"	100 centimes.		
Florin of the Netherlands,	40	"	100 do.		
Florin of the Southern States of Germany,	40	"	60 kreutzers	of	4 pfennings.
Florin of Austria and Trieste,	48½	"	60 do.	"	4 do.
Florin of Nuremburg and Frankfort,	40	"	60 do.	"	4 do.
Florin of Bohemia,	48½	"	60 do.	"	4 do.
Guilder of Netherlands, etc., same as Florins.					
Lira of the Lombardo and Venetian Kingdom,	16	"	100 centisimi	"	100 milleseimi.
Livra of Leghorn,	16	"	20 soldi	"	12 denari.
Lira of Tuscany,	16	"	20 do.	"	12 do.
Lira of Sardinia,	18 6-10	"	4 reali	"	20 soldi.
Livre of Genoa,	18 6-10	"	20 soldi	"	12 denari.
Milrea of Portugal,	1 12	"	1000 reas.		
Milrea of Madeira,	1 00	"	1000 do.		
Milrea of Azores,	83⅓	"	1000 do.		
Marc Banco of Hamburg,	35	"	16 shillings	"	12 pfennings.
Ounce of Sicily,	2 40	"	30 tari	"	20 grani.
Pound sterling of Great Britain,	4 84	"	20 shillings	"	12 pence.
Pound sterling of Jamaica,	4 84				
Pound sterling of British Provinces of Nova Scotia, New Brunswick, Newfoundland and Canada,	4 00	"	20 shillings	"	12 pence.
Pagoda of India,	1 84	"	36 fanams	"	48 jittas.
Real vellon of Spain,	5	"	34 maravedis.		
Real plate of Spain,	10	"	34 do.		
Rupee Company and British India,	44½	"	16 annas	"	12 pice.
Rix dollar (or thaler) of Prussia and the Northern States of Germany,	69	"	30 groschen	"	12 pfennings.
Rix dollar (or thaler) of Bremen,	78¾	"	72 grotes	"	5 swares.
Rix dollar (or thaler) of Berlin, Saxony and Leipsic,	69	"	30 groschen	"	12 pfennings.
Rouble, silver, of Russia,	75	"	100 kopecks.		
Specie dollar of Denmark,	1 05	"	6 marks	"	16 skillings.
Specie dollar of Norway,	1 06	"	6 do.	"	16 do.
Specie dollar of Sweden,	1 06	"	48 skillings	"	12 'ore.
Tale of China,	1 48	"	10 mace	"	100 candarems.
Banco rix dollar of Sweden and Norway,	39¾				
Banco rix dollar of Denmark,	53				
Crown of Tuscany,	1 05	"	20 soldi	"	12 denari.
Guracoa guilder,	40	"	20 stivers	"	12 pfennings.
Leghorn dollar or pezzo,	90 76-100	"	20 soldi	"	12 denari.
Livre of Catalonia,	53½	"	20 sueldos	"	12 dineros.
Livre of Neufchatel,	26½	"	20 sols	"	12 deniers.
Swiss livre,	27	"	100 centimes		
Scudi of Malta,	40	"	12 tair	"	20 grani.
Scudi, Roman,	99 a 99½				
St. Gall guilder,	40 36-100	"	60 kreutzers	"	4 pfennings.
Rix dollar of Batavia,	75	"	48 stivers.		
Roman dollar,	1 05				
Rouble, paper, of Russia,		"	100 kopecks.*		
Turkish piastre,	5	"	100 aspers.		
Current mark,	28				
Florin of Prussia,	22¾				
Florin of Basle,	41				
Genoa livre,	21				
Livre tournois of France,	18½				

* Varies from 4 roubles 65 copecks to 4 roubles 84 copecks to the dollar.

TABLE OF FOREIGN WEIGHTS AND MEASURES.

Reduced to the Standard of the United States, and as received at the United States Custom Houses.

ALEXANDRIA (EGYPT).

Cantaro of 100 rottoli farforo of 15 oz. (avoirdupois)	=	93½ lbs.
100 rottoli zaydino of 21¼ oz.	=	133⅛ "
100 " zaura of 33 oz.	=	207 "
100 " mina of 26⅔ oz.	=	167 "
1 oke 400 drams of 16 carets each	=	43 "

ALICANT (SPAIN).

Arroba	=	27 lbs. 6 oz.
Quintal	=	109½ "

AMSTERDAM.

100 lbs. 1 centner	=	108.93 lbs.
Last of grain	=	85.25 bush.
Ahm of wine	=	41.00 gall.
Amsterdam foot	=	0.93 foot.
Antwerp foot	=	0.94 "
Rhinland foot	=	1.03 "
Amsterdam ell	=	2.26 feet.
Ell of the Hague	=	2.28 "
Ell of Brabant,	=	2.30 "
Medden or measure of coal	=	2¾ bush.

ANCONA (ITALY).

100 lbs. Roman	=	102.75 Ancona.
100 " Ancona	=	73.75 lbs.

ARRAGON (SPAIN).

Libras of 100 lbs.	=	77.01 lbs.
Quintal, 4 arrobas of 36 lbs.	=	112.00 "

BASSORA (PERSIAN GULF).

Maund attary, 25 vakias tary	=	28.05 lbs.
One vakias	=	19 oz.

BATAVIA (E. INDIES).

Large bahar	=	4½ peculs.
Small "	=	3 "
1 pecul	=	100 catties.
1 catty	=	16 tales.
1 pecul	=	135 lbs. 10 oz.

BERGEN (NORWAY).

Shippond of 20 lisponds	=	320 lbs.
Centner of 6¼ lisponds	=	100 "
Lispond	=	16 "
Waag, 3 bismar lbs.	=	36 "
1 lb., 2 marcs, 16 oz., 32 loths.		
100 Norway lbs.	=	110.23 lbs.

CHRISTIANA (NORWAY).

Shippond	=	352 lbs.

LAURWIG (NORWAY).

Shippond	=	352 lbs.

BOMBAY.

Candy	=	260 lbs.
Maund	=	28 "
Seer	=	11 1-5 oz.
Candy	=	20 maunds.
Maund	=	40 seers.
Seer	=	30 pice.

BREMEN.

Shipfund	=	2½ centners.
Centner	=	116 lbs.
Waag of iron	=	120 "
Stone of flax	=	20 lbs.
Stone of wool	=	10 "
Lispund	=	14 "
100 lbs.	=	109.8"

CADIZ (SPAIN).

Quintal of 4 arrobas	=	100 lbs.
1 lb., 2 marcs, 16 oz. or 256 adarms.		
100 lbs.	=	101.43 lbs.

CAIRO (EGYPT).

Cantaro, 100 rottoli	=	95 lbs.
1 rottoli	=	144 drams.
Occa	=	400 drams or 26.39 lbs.
36 occas	=	1 cantaro.

CHINA.

Tale	=	1⅓ oz.
16 tales=1 catty	=	1⅓ lbs.
100 catties=1 picul	=	133⅓ "

CONSTANTINOPLE.

Quintal	=	100 rottolis.
do.	=	45 okes.
do.	=	176 cheques.
do.	=	127 lbs.
One oke	=	2 lbs. 13 oz. 4 drams.

CALCUTTA.

Maund	=	40 seers.
Seer	=	16 chattacks.
English factory maund	=	74 lbs. 10 oz.
Seer	=	1 lb. 13 oz.
Chattack	=	1 oz.
Bengal bezar maund is 10 per cent. heavier than the factory maund.		
Bezar maund	=	82 lbs. 2 oz. 2 1-13 drams.
Seer	=	2 lbs. 13⅔ drs.
Chattack	=	2 oz. 5-6 drs.

DENMARK.

100 lbs=1 centner	=	110.28 lbs.
Barrel or toende of corn,	=	3.95 "
Viertel of wine,	=	2.04 galls.
Copenhagen or Rhineland ft.	=	1.03 foot.
Centner or 100 lbs. Denmark	=	110.28 lbs.
Shipfund=20 lispunds	=	320 lbs.
1 lispund	=	16 "
1 bismerpund	=	12 "
1 waag=3 bismerpunds	=	36 "

ENGLAND.

Old ale gallon	=	1.22 galls.
Imperial gallon	=	1.20 "
Old wine "	=	1.00 "
Quarter of grain, or 8 imperial bushels	=	8.25 "
Imperial corn bushel, or 8 imperial gallons	=	1.03 "
Old Winchester bushel	=	1.00 "
Imperial yard	=	36 inches.
Troy pound	=	144-175 of a lb. avoirdupois.
Newcastle chaldron	=	36 bush.
Stone	=	16 lbs.
Tun of wine	=	256 imp. galls.

FRANCE.

Metre	=	3.28 feet.
Decimetre (1-10th metre)	=	3.94 inches.
Velt	=	2.00 galls.
Hectolitre	=	26.42 "
Decalitre	=	2.64 "
Litre	=	2 11 pints.
Kilolitre	=	35.32 feet.
Hectolitre	=	2 84 bush.
Decalitre	=	9.08 quarts.
Milier	=	22.05 lbs.
Quintal	=	220.54 "
Killogramme	=	2.21 "
100 pounds	=	107.93 "
100 feet	=	106.60 feet.
Tun (of wine)	=	240.00 galls.

FLORENCE AND LEGHORN.

100 lbs. or 1 cantaro	=	74.86 lbs.
Moggio of grain	=	10.59 bush.
Barile of wine	=	12.04 galls.

GENOA.

100 lbs. or peso grosso	=	76.87 lbs.
100 " or peso sottile	=	68.89 "
Mina of grain	=	3.43 bush.
Mezzarola of wine	=	39 22 galls.

HAMBURG.

Last of grain	=	89.64 bush.
Ahm of wine	=	38.25 galls.
Hamburg foot	=	0.90 foot.
Ell	=	1.22 "
Shipfund, equal to 2½ centners, or 280 lbs. Hamburg	=	299 lbs.
1 centner	=	8 lispunds, or 112 lbs. Hamburg.
1 lispund	=	14 lbs. Hamb'g
1 stone of flax	=	20 " "
1 stone of wool	=	10 " "
1 stone of feathers	=	10 " "
100 lbs. Hamburg	=	106.8 lbs.

ITALY.

100 rottoli of 31 3-7 oz. each	=	196¼ lbs.
1 cantaro grosso	=	196¼ "

MADRAS.

Candy	=	500 lbs.
"	=	20 maunds.
Maund	=	8 bis.
Bis	=	8 seers.

MALACCA.

Pecul	=	135 lbs.
A pecul	=	100 catties or 1600 tales.

MALTA.

100 lbs. 1 cantaro	=	174.50 lbs.
Salma of grain	=	8.22 bush.
Cantaro	=	100 rottoli.
Rottoli	=	30 oz.
1 cantaro (mercantile usage)	=	175 lbs.

NAPLES.

Cantaro grosso	=	196.50 lbs.
" picolo	=	106.00 "
Carro of grain	=	52.24 bush.
" wine	=	264.00 galls.

NETHERLANDS.

Ell	=	3.28 feet.
Mudde of Zak	=	284.00 bush.
Vat hectolitre	=	26.42 galls.
Kan litre	=	2.11 pints.
Pond killogramme	=	2.21 lbs.
100 pounds	=	108.93 "

PORTUGAL.

100 pounds	=	101.19 lbs.
22 pounds (1 arroba	=	32.00 "
4 arrobas of 32 lbs. (1 quintal)	=	1.28 "
Alquiere	=	4 75 bush.
Mojo of grain	=	23 03 "
Last of salt	=	70 00 "
Almude of wine	=	4.37 galls.

PRUSSIA.

100 lbs. of 2 Cologne marks each	=	103.11 lbs.
Quintal, of 110 lbs.	=	113.42 "
Sheffel of grain	=	1.56 bush.
Eimar of wine	=	18.14 galls.
Ell of cloth	=	2.19 feet.
Foot	=	1.03 foot.

ROME.

Rubbio of grain	=	8.36 bush.
Barile of wine	=	15.31 galls.
100 Roman lbs.	=	74.77 lbs.

RUSSIA.

100 lbs. of 32 loths each	=	90.26 lbs.
Chertwert of grain	=	5.95 bush.
Vedro of wine	=	3.25 galls.
Petersburg foot	=	1.18 foot.
Moscow foot	=	1.10 "
Pood	=	36.00 lbs.

SICILY.

Cantaro grosso	=	192.50 lbs.
" sottile	=	175 lbs.
100 pounds	=	70 "
Salma grossa of grain	=	9.77 bush.
" generale	=	7.85 "
" of wine	=	23.06 galls.

SPAIN.

Quintal, or 4 arrobas	=	101.44 lbs.
Arroba	=	25.36 "
" of wine	=	4.43 galls.
Fanega of grain	=	1.60 bush.

ST. GALL.

100 heavy lbs.	=	128 lbs.
100 light "	=	102 "

SURAT.

20 Surat maunds, or 10 Bengal factory maunds	=	1 candy.
1 candy	=	746 lbs. 10 oz.

SWEDEN.

100 lbs. or 5 lispunds	=	73.76 lbs.
Kan of corn	=	7.42 bush.
Last	=	75.00 "
Cann of wine	=	69.09 galls.
Ell of cloth	=	1.95 foot.
20 commercial lbs.	=	1 lispund.
20 lispunds	=	1 skeppund.

SMYRNA.

100 lbs. (1 quintal)	=	129.48 lbs.
Oke	=	2.83 "
Quillot of grain	=	1.46 bush.
Quillot of wine	=	13.50 galls.

TRIESTE.

100 pounds	=	123 60 lbs.
Stajo of grain	=	2.34 bush.
Orna or eimer of wine	=	14.94 galls.
Ell for woolens	=	2 22 feet.
Ell for silk	=	2.10 "

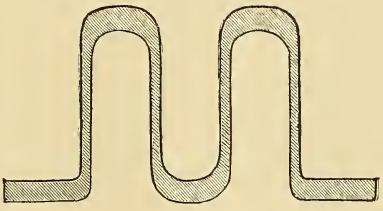
VENICE.

100 lbs. peso grosso	=	105.18 lbs.
100 " " sottile	=	66.04 "
Moggio of grain	=	9.08 bush.
Anifora of wine	=	137.00 galls.

MONTGOMERY'S PATENT CORRUGATED IRON.

Longitudinal View of Beam.

For Bridges, Buildings, Ships, Canal Boats, Railroad Passenger, Freight, Coal Cars, etc.



End View, showing Enlarged Lamina.

HORSE RASPS.

HELLER'S.

Manufacturers' New List.

14 inches long,	- - - - -	$13.00 per doz.
15 do.	- - - - - -	16.00 do.
16 do.	- - - - -	19.00 do.

These Rasps are made from the best steel, and cut by hand. As the supply is limited, we would suggest that our friends give early notice of their wants, as all orders will be executed according to date of receipt.

We have the exclusive agency of the Northwest, and orders will have our best attention. To prevent counterfeits, all rasps of this brand will bear our name in connection with the manufacturers'.

HALL, KIMBARK & Co.

SPRING HOLDER.

Malleable Iron, - - - - - 75 cents per pair.

END BOARD ROD NUTS AND WASHERS.

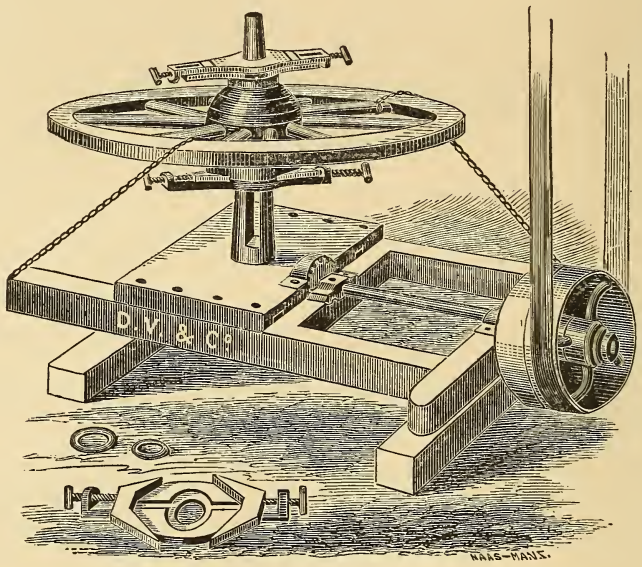
Wrought Iron, - - - - - per lb.

HARROW TEETH.

IMPROVED PATTERN.

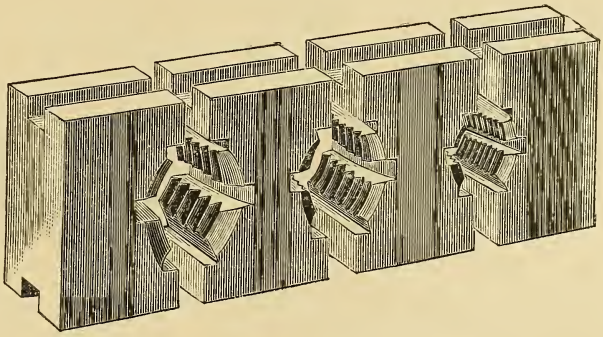
1 inch square, - - - - - per lb.
$\frac{7}{8}$ do. } - - - - - $\frac{1}{4}$ cent extra do.
$\frac{3}{4}$ do. }
$\frac{5}{8}$ do. - - - - $\frac{1}{2}$ cent do. do.

BREMMERMAN'S SELF-CENTRING HUB REAMING MACHINE.

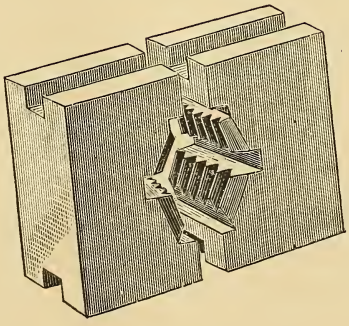


This machine is so simple that any person can learn to operate it in 15 minutes' time. To adjust it, select from the set of rings one which will fit the small end of the box to be used, and place it upon the reamer. Then select another enough larger to pass down the reamer, so that the distance between the rings will be one-half inch greater than the length of the hub. Place the rings in the chucks, and adjust and fasten them to the hub. Place the wheel on the reamer; hook the chains to opposite spokes, passing them outside the felloes, and connect the power. Be sure and poke down the shavings as fast as they accumulate. This is done by working the little rod up and down through the top of the reamer. The hand machine is operated by turning the wheel; the reamer is made stationary. We furnish 26 rings with each machine, assorted so they will fit any size box, from 2¾ to 6 inches. The reamer should run about 33 revolutions per minute. A hub can be reamed in less than two minutes, with power; by hand, in about five minutes. The work done by this machine is entirely satisfactory, being a perfect fit for the boxes, making a smooth tapering hole, clipping the ends of the spokes, without splitting the hub in the least; hence, not weakening the hub about the tenons of the spokes. Every machine warranted to give satisfaction.

Price of Power Machine, - - - - - $80.00
" Hand " - - - - - $40.00



For No. 1 and 2	stock,	$12.00
" 3 " 4	do.	10.00
" 5 " 5½	do.	8.00
" 6	do.	6.00
" 7 " 9	do.	3.50
" 11 " 15	do.	3.00
" 17 " 19	do.	2.50
" 21 " 23	do.	2.00
" 25, 27, 32	do.	2.25
" 33	do.	1.50
" 34	do.	2.00
" 35, 37, 38, 41, 42	stock,	1.50
" 45 and 47	do.	2.25
" 49 " 51	do.	2.00
" 53	do.	1.50



WADSWORTH

IRON WORKS,

CHARLES F. WADSWORTH, Pres't. GEORGE BEALS, Vice Pres't.
JOHN W. DAVOCK, Secretary and Treasurer.

MANUFACTURERS OF

SHAFTING IRON,

Bar Iron, Pig Iron, Bridge Iron,

TEE IRON,

ANGLE IRON, CHANNEL IRON,

AND

WROUGHT IRON GIRDER BEAMS FOR BRIDGES AND BUILDINGS.

☞Special attention given to special shapes and lengths.

HALL, KIMBARK & CO.,

AGENTS AT CHICAGO.

Sole Manufacturers of the Celebrated Union Shafting Iron. This Iron is justly celebrated for its strength and smooth surface, it is perfectly straight, has no short turns usually found in shafting iron, and can be placed in the lathe without the usual precaution of straightening, which is a great saving in the cost of turning.

ARCHIMEDEAN AXLE WORKS.

ESTABLISHED 1865.

ANCHOR BRAND AXLES,

FOR

BUGGIES, ROAD WAGONS, SULKIES,

CARRIAGES, COACHES, STAGES, EXPRESS WAGONS, ETC.

TRADE MARK.

All of our Axles are branded with our Trade Mark, and warranted Solid Collars.

N. B.—LIST OF PRICES furnished on application.

The ARCHIMEDEAN AXLES (Anchor Brand) are made from fine grades of Iron, and every arm hammered from the solid bar—the greatest care exercised in rendering desirable styles and perfect fits and finish—thus making the brand superior to any in market.

Among recent improvements may be named: Substituting the hammering process in place of upsetting; making more taper in arm; shorter and larger swell on arm, giving more strength where most needed and more bearing to arm; adding machine-pressed washers; smaller nut; a box that cuts away less of the hub and at same time having sufficient strength;—in fine, overlooking nothing in the way of improvement, both to style and finish, that will add to this already popular and world-known brand of fine Axles.

All Axles on our orders are made specially for us, and bell of box painted fine red.

Annual product over 30,000 sets, and the demand constantly increasing.

WAGON MAKERS

IN BUYING

WOOD WORK

CAN ALWAYS BE CERTAIN OF GETTING A GOOD ARTICLE, IF BRANDED

"WRIGHT."

IF NOT FOUND AS REPRESENTED, THE MONEY WILL BE RETURNED.

HAMMER HANDLES,
OVAL SINGLETREES,
ROUND SINGLETREES,
BUGGY SINGLETREES,
EXPRESS SINGLETREES,
WAGON NECK YOKES,
BUGGY NECK YOKES,
WAGON EVENERS,
BUGGY EVENERS,
EXPRESS SHAFTS,
BUGGY POLES,
PLOW HANDLES,
CUTTER STUFF,
CUTTER KNEES AND BEAMS,

AND

BOB SLED RUNNERS, SOLID BEND,

FROM 2 INCHES TO 5 INCHES DEEP.

MANUFACTURED FOR

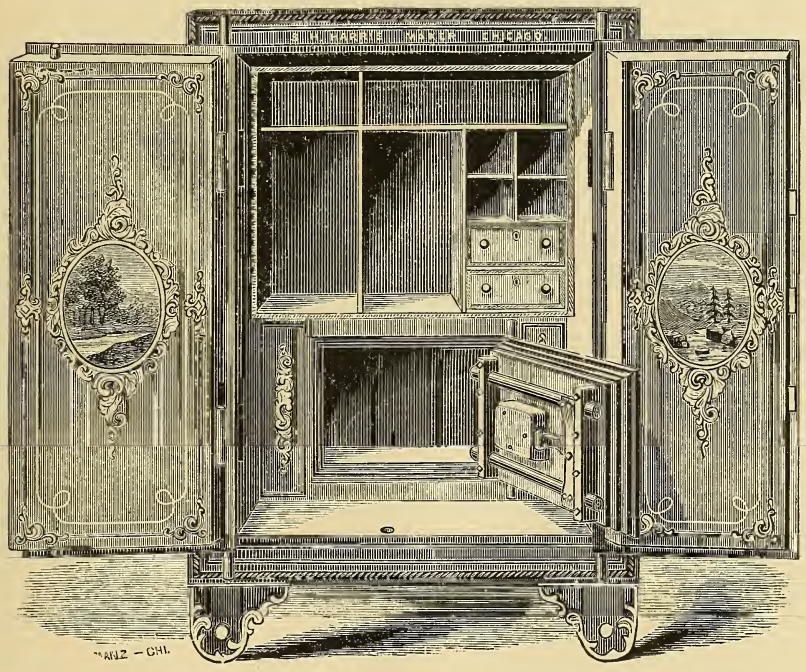
HALL, KIMBARK & CO.,

80, 82 and 84 MICHIGAN AVENUE, - CHICAGO.

S. H. HARRIS,

MANUFACTURER OF

Fire and Burglar Proof Safes.



VAULT WORK, DWELLING HOUSE SAFES

AND ALL KINDS OF BANK LOCKS FURNISHED.

No. 62 SOUTH CANAL STREET, - - CHICAGO.

They are so constructed that the bolts of the doors shut behind a wrought iron frame, which forms the front of the safe, avoiding all danger of their being forced open by falling.

Owing to the peculiar construction of the door jamb, they will resist the action of fire for a longer time than has thus far been found necessary for perfect safety.

THESE SAFES HAVE BEEN TESTED IN THE LARGEST FIRES IN THIS COUNTRY

Without a single failure to preserve their contents.

PRICES LOWER THAN ANY OTHER RELIABLE SAFE.

THE OLDEST BELT MANUFACTURER IN CHICAGO.

ESTABLISHED 1868.

W. H. WHITMARSH,

MANUFACTURER OF

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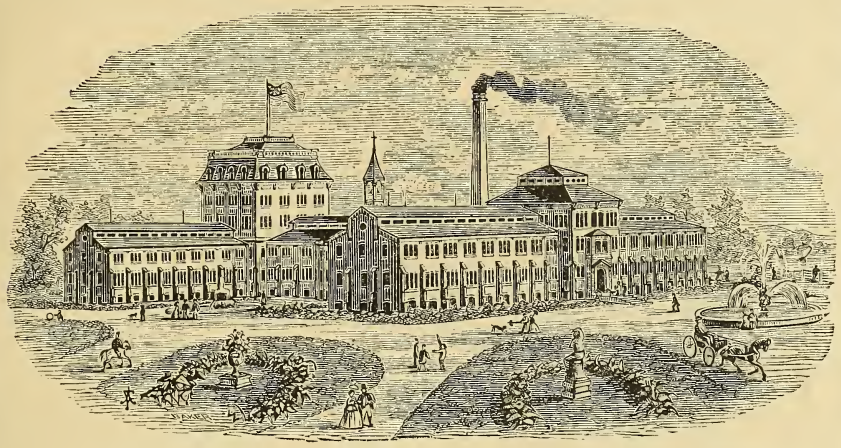

NATIONAL WATCH COMPANY.

OFFICE GEN'L SUP'T U. P. R. R., OMAHA, NEB., Dec. 16, 1869.

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AMERICAN MERCHANTS' UNION EXPRESS CO., CHICAGO, Feb. 17, 1870.

T. M. AVERY, Esq., Pres't National Watch Co., Chicago, Ills.

Dear Sir:—It gives me pleasure to state that the two or three Elgin Watches I have at different times purchased for presentation have given entire satisfaction, and are highly valued as elegant and correct time-keepers. A very large number of your Watches are being carried by the Messengers in the employ of this Company, and are giving entire satisfaction, their time-keeping qualities being implicitly relied upon.

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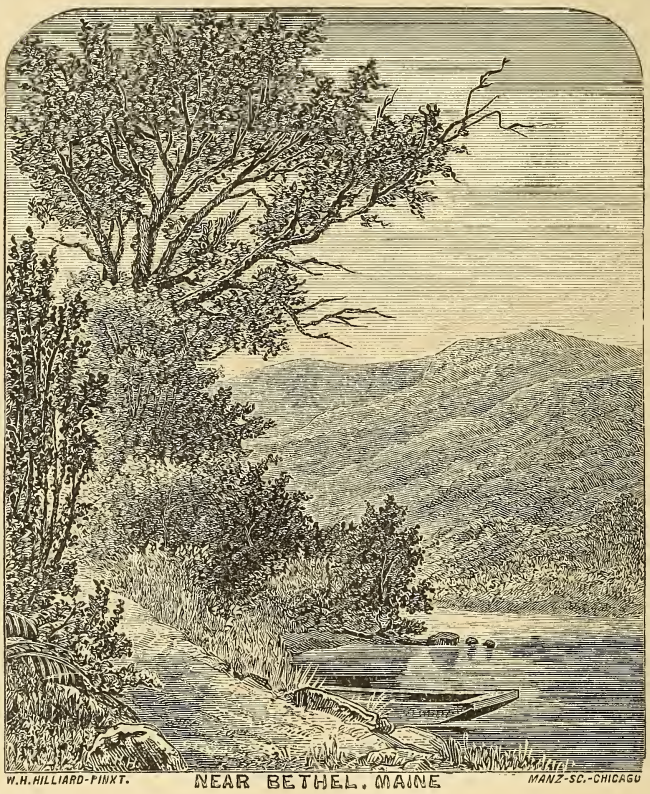

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